# AUTHOR INDEX


A

Abadi, D. M., 700
Abbott, J., 634
Abeles, R. H., 228, 229, 230, 234, 235, 236, 370, 372, 373
Abelson, J. N., 132, 133
Abram, D., 522
Abrams, M. E., 294
Abrams, R., 208, 210, 211, 233
Abul-Hajj, Y., 672
Accorsi, A., 700
Acher, R., 702, 780
Achey, P. M., 182
Adair, G. S., 526
Adams, A., 144, 441
Adams, G. A., 318
Adams, H. R., 750, 757, 758, 780, 781
Adams, J. J., 737, 776
Adams, M., 703
Adams, R. L. P., 211
Adelberg, E. A., 95, 190, 427, 624
Adelman, R. C., 279
Adelstein, R. S., 528
Adema, J., 192
Adhya, S., 420, 429
Adler, A., 441
Adler, A. D., 754
Adler, J., 193, 419, 420
Adye, J., 521, 522
Agranoff, B. W., 307, 324
Agren, G., 372
Aguirre, M., 552, 556
Ahktar, M., 672, 686, 687
Ahmed, S. I., 393
Ahrens, E. H., Jr., 315
Aida, K., 55
Ailhaud, G. P., 304, 305, 306
Airth, R. L., 598, 605, 606, 607, 617, 618
Ajl, S. J., 680
Akabori, S., 732, 744
Åkeson, Å., 35, 36, 44, 666, 745
Akiyama, M., 320
Alberici, A., 152, 153
Albers, R. W., 479
Alberts, A. W., 304, 305
Alberts, B., 113
Albertsson, P. Å., 14, 15
Alberty, R. A., 371
Albino, A. M., 565
Alexander, G. J., 689
Allam, A. M., 241, 242
Allan, N., 754
Allan, P. W., 211
Allen, A. D., 335, 353
Allen, S. H. G., 227
Allewell, N. M., 26, 31, 32, 37, 39, 40, 41, 43, 45, 363, 365, 366, 383, 515
Allfrey, V., 643, 647, 648
Alonso, D., 151
Alpers, D. H., 428
Altar, W., 455, 456
Alter, S., 163
Alving, R. E., 528
Amaha, M., 64
Ambler, R. P., 735, 745
Ambrose, C. T., 512
Ames, B. N., 422, 426, 427
Anagnostopoulos, C., 95, 105
Anbar, M., 626
Andersen, S. O., 563
Anderson, B., 478, 479
Anderson, B. M., 373
Anderson, E. P., 214
Anderson, J. A. C., 119, 123
Anderson, J. S., 472
Anderson, P., 124
Anderson, P. M., 202, 203
Anderson, R. S., 602
Ando, K., 382, 702, 705, 706, 745
Andoh, T., 120
Andreoli, T. E., 481, 484, 485
Andrews, L. J., 697
Anesey, J., 553, 557
Anfinsen, C. B., 36, 416, 680, 699, 700, 701, 705, 709, 729, 768, 779
Angelo, N., 72
Anraku, N., 190
Anraku, Y., 478
Ansell, G. B., 307, 315, 317
Anton, D. N., 422
Antonini, E., 389, 394, 400, 452, 746, 753, 754
Antonis, A., 160
Anufrieva, E. V., 447
Anwar, R. A., 558
Aoyama, M., 706
Aoyama, T., 600, 601
Apgar, J., 131, 132, 136, 146
Apirion, D., 116, 118, 125
Aposhian, H. V., 192, 193, 219
Appel, P., 530, 532
Appel, S. H., 204
Appella, E., 105, 498, 761, 762, 768, 771, 772
Appleman, M. M., 153, 167
Argaman, M., 464
Argy, W. P., 164
Ariens, E. J., 154, 158
Arigoni, D., 228, 230, 683, 685
Arion, W. J., 261, 294, 295
Armentrout, R. W., 516
Arms, K., 638
Armstrong, J. M., 46, 448, 449, 451, 708
Armstrong, M. D., 528, 533
Arnaiz, G. R. D. L., 152, 153
Arnaud, M., 65, 66
Arnold, J. S., 599, 625
Arnold, W. A., 615
Arnon, D. I., 333, 334, 337, 341
Aron, R., 761
Aronson, A. I., 56, 68, 70, 72, 75, 110, 111, 115, 122, 124, 140
Arrington, S., 382
Arvidson, G. A. E., 309
Asai, H., 529
Asakura, S., 521, 522
Asatoor, A. M., 528, 533
Ashmore, J., 151, 260, 287, 288, 289, 290, 293
Ashton, D. M., 205, 391, 397
Ashworth, L., 467
Askari, A., 216
Askew, J., 220
Askonas, B. A., 502
Asselineau, J., 466
Astrin, K. H., 762
Atassi, M. Z., 699, 717
Atchley, W. A., 648
Atherton, R. S., 314
Atkinson, D. E., 167, 202, 205, 218, 250, 269, 283, 284, 360, 362, 390, 400
Atsmon, A., 114
Attardi, B., 643, 650
Attardi, G., 111, 425, 643, 650
Atwood, K., 123
Atwood, K. C., 641
Aubert, J-P., 59, 66, 75

Audier, H., 688
Augenstein, L., 587
Augenstein, L. G., 614
August, J. T., 143
Aulich, A., 156, 158, 159, 168
Aurbach, G. D., 165, 168
Aurisicchio, A., 413
Austen, K. F., 509, 510
Autilio, L. A., 467
Avey, H. P., 31
Avigad, G., 454
Avigan, J., 464
Avogardo, L., 762
Awdeh, Z. L., 502
Axelrod, V. D., 131, 132, 136, 145
Axen, R., 17
Aydin, A., 159
Ayers, J., 717
Ayres, J. C., 55
Azerad, R., 688
Azuma, N., 527
Azzone, E. A., 281

B

Babad, H., 151, 165, 168
Babakov, A. V., 486
Babin, D. R., 750, 780
Babior, B., 232
Bach, J. A., 59, 60, 81
Bach, M. L., 60, 89
Bachelard, H. S., 261, 275, 293, 294
Bachur, N. R., 312
Bachvarova, R., 643
Back, K. J. C., 93
Baddiley, J., 310, 312, 319
Baer, E., 312, 318
Baev, A. A., 131, 132, 136, 145, 441
Baglioni, C., 499, 501, 761, 769, 773, 775, 780
Bahl, O. P., 731, 737, 776, 777
Bailey, E., 253, 271, 279, 296
Bailey, K., 526, 735
Bailey, P., 653
Bailin, G., 275, 393, 529, 530, 535
Baillie, A., 62
Baird, C. E., 158, 159, 160
Baird, S. L., Jr., 584, 585
Bak, T. G., 711
Bakay, B., 464
Baker, B. R., 698
Baker, H., 532, 533
Baker, N., 286
Baker, T. I., 99, 100, 101
Baker, W. W., 651
Bakerman, H. A., 306
Balassa, G., 63, 71
Balbinder, E., 102, 105, 423
Baldwin, A. N., 384, 385
Baldwin, R. L., 104, 105, 575
Bale, W. F., 286
Balinsky, B. I., 632, 634
Balish, E., 90, 92
Ball, E. G., 160, 161
Ball, W. D., 645
Ballard, F. J., 259, 261, 293, 294
Ballou, C. E., 313, 314
Balls, A. K., 373
Banaszak, L. J., 35, 36, 41, 363, 702
Banerjee, A. K., 143
Banerjee, S. D., 523
Bangham, A. D., 457, 477, 489, 490
Bangham, J. A., 481, 484
Bárány, K., 529, 530, 535
Bárány, M., 528, 529, 530, 535
Barat, M., 95
Barbata, G., 643
Barbee, T., 94
Barber, A. A., 275
Barbour, S. D., 414, 415
Barden, R. E., 306
Barenholz, Y., 320
Bargetzi, J. P., 780
Baril, E. F., 529, 530
Barka, T., 165
Barker, H. A., 208, 225, 226, 227, 232, 245, 270
Barkley, D. S., 169
Barlow, G. H., 635, 737, 738, 739
Barman, T. E., 373, 707
Barnabas, J., 773, 775
Barnett, L., 143, 773, 776
Barnett, L. M., 708
Barnett, R., 229
Barra, H. S., 250
Barrell, B. G., 110, 111, 126, 137, 140, 440
Barrett, A. M., 160
Bartels, C. T., 322
Bartels, H., 254
Bartelstone, H. J., 158
Barthe, P., 162
Bartholomaus, R. C., 673
Bartley, W., 466
Barton, D. H. R., 683, 687
Bartsch, G. E., 263
Bartsch, R. G., 776
Baserga, R., 165
Basset, E. W., 506
Basset, J. M., 314
Batt, C. W., 715
Batt, R. D., 136
Batterham, T. J., 234
Battfay, O., 28
Bauer, C., 704
Bauerle, R. H., 101, 105, 423, 424, 425
Baumann, N. A., 315, 316, 466
Baumann, W. J., 314
Baumeister, W., 625
Bautz, E. K. F., 413
Bavetta, L. A., 565
Bayer, E., 334
Bayley, S. T., 113, 466
Bdolah, A., 151, 165, 168
Beale, D., 746, 750, 751, 752, 753, 754, 772, 773, 780
Bean, R. C., 484
Bear, R. S., 536
Beaudreau, C., 151, 168
Beaumont, J. L., 513
Beaumont, V., 513
Beaven, G. H., 573, 729
Beck, W. S., 207, 208, 209, 210, 233, 234, 235, 236
Becker, A., 194, 195
Beckwith, J. R., 411-36; 413, 414, 416, 417, 426, 427, 428
Beeman, W. W., 144
Beermann, W., 637, 729
Beers, J. R., 603
Beers, R. F., Jr., 192
Begg, G., 516, 750
Behrends, P. G., 617, 618
Beinert, H., 337, 673
Beiser, S. M., 506
Bejnarowicz, E., 453, 454, 474
Beldotti, L., 514
Belezikian, J. P., 430
Belitsina, B. Y., 116
Belitsina, N. V., 114
Bell, D., 138, 144
Bell, E., 635, 651, 653
Bellamy, D., 255
Bellas, T., 385, 661, 662, 667, 681
Belleau, B., 166
Bellelli, L., 754
Bellin, J. S., 716
Bello, J., 44, 363, 366, 448, 509, 515
Belocopitow, E., 167
Benacerraf, B., 500, 505, 507
Benassi, G., 59
Bender, M. L., 46, 360, 367, 371, 373
Benditt, E. P., 564, 565
Benedetti, E., 474
Ben-Efraim, S., 508
Benesch, R., 394, 400, 449, 452, 526, 696, 706, 754
Benesch, R. E., 394, 400, 449, 452, 526, 696, 706, 717, 754

Ben-Hamida, F., 429
Benjamin, W., 648
Benkovic, S., 370, 371
Bennett, D. A. H., 286
Bennett, J. C., 499, 729, 768, 771, 773
Bennett, L. L., 155
Bennett, L. L., Jr., 211
Bennett, R. E., 671
Bennett, R. G., 577
Ben-Porat, T., 479
Bensinger, R., 158, 164
Benson, A. A., 307, 310, 322, 473
Benson, A. M., 334, 737, 772, 775
Benson, E. S., 536
Benson, R. W., 535
Bensusan, A. B., 564
Benveniste, P., 683, 684, 685
Benzer, S., 781
Ben-Zvi, R., 151, 165, 168
Berberich, M. A., 428
Berends, W., 177
Berg, P., 137, 138, 139, 384, 385, 780
Berg, R. A., 574
Bergelson, L. D., 312, 318, 324
Berger, A., 389, 394, 701
Berger, A. W., 598
Berger, H., 144, 413, 773
Berger, J. A., 58, 59, 61
Berger, L. R., 307, 312
Berger, R. L., 389, 394
Bergersen, F. J., 333, 334, 337, 344, 346
Bergmann, F., 370, 371
Bergquist, A., 94
Bergquist, P. L., 136, 138
Bergstrom, L., 464
Bergstrom, S., 150, 159, 164
Berkowitz, D. B., 777
Berlin, R. D., 212
Berliner, L. J., 718
Bernal, J. D., 28, 36, 47
Bernfield, M. R., 634
Bernhard, S. A., 373
Bernhauer, K., 225
Bernier, G. M., 504, 761
Bernlohr, R. W., 60, 62, 66, 67, 72
Berry, A. J., 215
Berry, M. N., 255, 286
Bersohn, R., 575, 584, 585, 586
Berthet, J., 151, 155, 165, 310
Bertsch, L., 699
Bertsch, L. L., 55, 191, 193
Bessman, M. J., 176, 193, 219
Bethell, J. J., 288, 395
Bethune, J. C., 46
Betke, K., 754, 773, 774
Bettelheim, F. R., 735
Betz, A., 282, 283
Beukers, R., 177, 589
Beveridge, W. D., 335, 353
Beviz, A., 168
Bewley, T. A., 707
Bewsher, P. D., 151, 288, 290
Beychok, S., 437-62; 46, 441, 443, 445, 448, 449, 450, 451, 452, 453, 454, 455
Bhacca, N. S., 676
Bhattacharyya, R. N., 151, 168
Bianchi, R., 711, 712
Bickerstaffe, R., 316, 317
Bieber, L. L., 310
Bieck, P., 160, 162, 163, 168
Bielawski, J., 486
Bier, M., 699
Biggley, W. H., 606
Billen, D., 182
Billiar, R. B., 674
Bing, D. H., 515
Bird, D. W., 565
Birdsell, D. C., 465
Birge, E. A., 124, 125
Birnbaumer, L., 167
Birnboim, H. C., 650
Birnstiel, M. L., 641
Bishop, D. H. L., 143
Bishop, D. W., 523
Bishop, H. L., 54, 59, 63
Bishop, J., 419, 777
Bishop, J. O., 413
Bishop, J. S., 161, 167, 261
Bishop, W., 279, 285, 296
Biswas, C., 95, 207, 208
Bitensky, M. W., 150, 151, 153, 158
Bitler, B., 604
Bittman, R., 386, 389, 394
Biver, A., 156
Bjørnstad, P., 309, 320
Black, J. A., 775
Black, L. W., 183
Black, S. H., 59
Blackman, D., 371
Bladen, H., 465
Blair, D. G. R., 20
Blair, P., 476, 477
Blaisie, J. K., 478
Blake, C. C. F., 26, 37, 38, 39, 40, 41, 43, 44, 46, 363, 365, 373, 376, 377, 382
Blakley, R. L., 201-24; 206, 209, 210, 233, 234, 235, 236
Blank, M. L., 321
Blankenship, L. C., 56
Blaschko, H., 310
Blaurock, A. E., 478
Blaylock, B. A., 241, 242
Blecher, M., 151, 158, 160, 168
Blicharska, J., 65, 66
Blickenstaff, D., 168
Blinks, J. R., 157
Bloch, K., 319, 684, 685, 687
Blombäck, B., 735, 772, 777
Blombäck, M., 735, 777
Blomstrom, D. C., 334, 337
Blondin, G., 686
Bloom, B. M., 166, 667
Bloom, S. M., 447
Blout, E. R., 46, 444, 445, 446, 447, 448, 451
Blow, D. M., 26, 27, 29, 37, 39, 40, 43, 44, 363, 367, 448
Blume, A. J., 102, 105, 423
Blumenfeld, O. O., 549, 555, 556, 562
Blumenthal, H. J., 58, 59, 64, 65
Bly, C. G., 286
Bock, R. M., 110, 125, 413, 424, 468, 780, 781
Bode, V. C., 194, 620, 621
Bodwell, C. E., 526
Body, D. R., 310
Boeyens, J. C. A., 46
Boezi, J., 413
Boezi, J. A., 415
Bogdanov, A. A., 113
Bohak, E., 447
Bohme, R. H., 681
Bohr, C., 393
Boiron, M., 110, 111
Boles, M. O., 31
Bolle, A., 413, 425
Bollum, F. J., 177, 592
Bolotina, I. A., 395, 447
Bolton, W., 40, 44, 452
Boman, H. G., 110, 121
Bomstein, R. A., 307
Bonaduce, L., 216, 219
Bonanni, M. V., 59
Bond, G., 332, 337
Bonhoeffer, F., 188
Bonner, H., Jr., 305
Bonner, J., 646, 647, 648
Bonner, J. T., 169
Bonnet, R., 225
Bonsen, P. P. M., 311, 312, 322

Bookchin, R. M., 752, 772
Boos, W., 414
Bordley, J., 750, 751, 758, 780
Borek, F., 508
Boring, J., 466
Borisy, G. G., 539
Borkenhagen, L. F., 682
Bornstein, P., 550, 551, 552, 553, 554, 555, 556, 564, 566
Borod'ko, Yu. G., 335, 353
Boroff, D. A., 707, 716
Borun, T. W., 647
Botha, M. C., 753
Bott, K. F., 56
Bottomley, F., 335, 353
Bouchard, P., 309
Bouck, G. B., 621
Bourgeois, S., 414, 415
Bowen, W. J., 536
Bowman, R. H., 157, 279, 280, 281
Bowman, W. C., 155, 156
Bowness, J. M., 151
Boxer, G. E., 257, 413
Boyce, R. P., 177, 179, 180, 181, 182, 184, 185, 186, 189, 190, 192, 592
Boyd, E., 751
Boyd, G. S., 678
Boyd, J. W., 266
Boyer, H., 190
Boyer, P. D., 370, 395, 535, 717
Boyer, S. H., 750, 751, 758, 777, 780
Bradbeer, C., 231, 333, 334, 343, 345
Bradbury, E. M., 447
Bradley, D. F., 114, 126, 136, 441
Bradley, T. B., 754, 773, 774
Bradshaw, W. S., 645
Bragg, L., 25
Brahms, J., 441, 442, 443, 586, 587
Brammar, W. J., 144, 413, 773
Brana, H., 153
Brand, K., 253, 271, 276, 279, 282, 283, 296
Branden, C. I., 35, 36, 44
Brant, D. A., 38
Branton, D., 477
Bratvold, G. E., 155, 168, 274
Braun, V., 774
Braunitzer, G., 746, 748, 750, 774
Braunstein, A. E., 373
Bray, G. A., 160, 165
Bray, R. C., 232
Breckenridge, B. M., 156, 168
Breitman, T. R., 208
Bremer, H., 413
Bremer, J., 309
Brennan, P., 314
Brenner, S., 114, 132, 133, 143, 188, 413, 426, 479, 499, 768, 771, 772, 773, 776
Breslow, E., 449
Breslow, R., 683
Bresnick, E., 213, 214
Brewer, J., 324
Brew, K., 777, 778
Brewer, C. F., 708
Bridgeland, E. S., 279
Briehl, R. W., 754
Brierly, G. P., 470, 471, 474, 475
Brill, W., 429
Brill, W. J., 241, 242
Brimhall, B., 754, 773, 774
Brintzinger, H., 335, 352
Briskey, E. J., 528
Britten, R. J., 115
Brockman, R. W., 211, 214
Brodbeck, V., 778
Brodie, B. B., 150, 158, 160
Brodie, J. D., 236, 237, 239, 240, 241
Brodsky, A., 287, 291
Brody, S., 730, 780
Brody, T. M., 158
Brokaw, C. J., 523, 525
Brookes, P., 135, 178, 179, 181
Brooks, K., 187
Broquist, H. P., 84, 95
Brossard, M., 309
Brostoff, S. W., 144
Brot, N., 91, 237, 241
Brotz, M., 320
Brown, A. D., 466, 467
Brown, A. L., 530
Brown, B. J., 413
Brown, C. B., 154
Brown, D. D., 641, 642, 644, 645, 648
Brown, D. M., 413, 522, 772
Brown, J. C., 413
Brown, J. F., 371
Brown, J. H., 702, 704
Brown, J. L., 413
Brown, J. R., 779
Brown, K. D., 97
Brown, N. C., 206, 207, 392
Brown, R. H., 679, 680
Brown, R. J., 510
Brown, R. K., 704, 712
Brown, S. S., 219
Brown, W., 536, 537, 538
Brown, W. D., 535
Browne, R. J., 599
Browning, E. T., 273, 276, 277, 289, 290
Brownlee, G. G., 110, 111, 126, 137, 140, 440
Brownson, C., 208, 209, 233, 234, 235, 236
Brownstein, A. M., 229
Brownstein, B. L., 121
Brueckner, D. A., 28
Bruice, T., 370, 371
Brundish, D. E., 310, 312, 319
Brunori, M., 389, 394, 452, 754
Bruskov, V. I., 649
Bryne, R. W., 133, 144
Brzozowski, T., 202
Bscheider, H. P., 191
Bucci, E., 452
Buccino, G., 218, 219
Buchanan, B. B., 334, 337
Buchanan, J. M., 236, 239, 240
Bucher, T., 253
Buchert, A. R., 716
Buck, C. A., 124
Buck, E., 608
Buck, J. B., 605, 608, 609
Buckley, C. E., III, 503
Bueding, E., 158, 275
Buettner-Janusch, J., 750, 757, 758, 759
Buettner-Janusch, V., 758
Buffe, D., 504
Bui, P. T., 341
Bukreev, V. S., 335, 353
Büllbring, E., 158
Bulen, W. A., 333, 334, 335, 336, 338, 339, 340, 341, 342, 343, 344, 346, 347, 350
Bump, S., 554
Bumpus, F. M., 324
Bunim, J. J., 514
Bunn, H. F., 452
Buonassisi, V., 634
Buono, F., 60
Burg, M. B., 164
Burger, M., 424
Burger, R., 214, 216
Burgi, E., 194
Burke, J. J., 386
Burley, R. W., 709
Burlingame, A. L., 684, 685
Burn, J. H., 156
Burnasheva, S. A., 522, 524, 525
Burnet, M., 768
Burnett, F. F., 294, 295
Burns, R. C., 331-58; 332, 333, 334, 336, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 350
Burns, V. W., 204, 205

Burokas, S., 635
Burr, M., 717, 718
Burris, R. H., 332, 333, 334, 335, 336, 338, 339, 340, 342, 343, 344, 345, 346, 347, 348, 350, 351
Burrows, C., 712
Burstein, C., 414, 429
Burstein, S. R., 150, 151, 158
Burtin, P., 504
Burton, K., 131
Burton, S. D., 161, 163
Burwell, R. L., 342, 346
Bush, C. A., 126, 437, 438, 441, 442, 443, 445
Butcher, R. W., 149-74; 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 168, 250, 251, 274, 288, 289, 291
Butler, L., 365
Butler, P. J. G., 699
Butler, T. C., 274
Butterfield, W. J. H., 294
Butterworth, P. H. W., 306
Buttin, G., 414, 419, 420, 428, 429
Buttkus, H., 701
Buzhinski, E. P., 485
Byers, B., 653
Bynum, E., 713
Byrne, R., 703

C

Cabannes, R., 757
Cadenas, E., 273
Cahill, G. F., 260, 288, 290, 293, 294
Cahn, M. B., 634
Cahn, R. D., 634
Cahnmann, H. J., 761
Cairns, J., 178, 187
Caldwell, P. C., 274
Callan, H. G., 650
Callan, T. P., 715
Callis, R., 443
Calson, R., 419
Calvin, M., 589, 590
Cambon, P., 56, 57, 59, 62, 63, 64
Cammack, K. A., 113
Campanile, E., 217
Campbell, J. C., 645
Campbell, N. E. R., 334
Campbell, P. N., 778
Campbell, W., 729, 773, 780
Campion, D. S., 274
Canellakis, E. S., 210
Canfield, R. E., 68, 363, 779
Cann, H. M., 634
Cannata, J. J. B., 227
Cannon, W. D., Jr., 208
Canovas, J. L., 279
Cantoni, G. L., 135, 136, 137, 144
Cantor, C. R., 437, 438, 439, 440, 443, 445, 731, 776
Capecchi, M. R., 780
Caplow, M., 373
Caputo, A., 394, 400, 452, 746
Caputto, R., 250
Carbon, J., 780
Carbonara, A., 762, 769
Cardinale, G. J., 228
Carhart, S. R., 522
Carlise, C. H., 31
Carlton, B. C., 103, 413, 729, 730
Carnahan, J. E., 332, 334, 336, 339, 341, 342, 344
Carnes, W. H., 565
Carney, A. L., 701, 702
Carney, J. A., 530
Caro, L. G., 188
Carpenter, A., 678
Carr, D. O., 136
Carrell, R. W., 751, 753
Carrier, W. L., 177, 180, 182, 189, 192, 583, 589
Carroll, W. R., 528, 735
Carsiotis, M., 105
Carter, C. E., 219
Carter, H. E., 318
Carter, J. R., 306, 479
Carter, N. W., 274
Carver, J. P., 46, 445
Case, J. F., 608
Case, M. E., 393
Cashel, M., 59, 62
Caskey, C. T., 205, 391, 397
Caspar, D. L., 508
Cass, A., 484, 485
Cass, M. W., 599, 606
Cassidy, H. G., 699, 702
Castle, J. E., 332, 334, 342, 344, 346
Castle, M., 686
Casu, A., 314
Cathou, R. E., 515
Catt, K. J., 778
Cauthen, S. E., 92, 236
Cavicchi, P., 653
Cebra, J. J., 503, 504, 505, 761, 767
Ceccarini, C., 643
Cecil, R., 717
Celikkol, E., 59, 61
Centeno, E. R., 510
Ceppellini, R., 777
Cerletti, P., 470, 471
Cha, C. Y., 700
Chadhuri, A. C., 678
Chai, N., 480
Chaikoff, I. L., 669, 670
Chaix, P., 55, 464, 465, 466
Chalkley, R., 647
Chalmers, J. H., Jr., 102, 103
Chaloupecky, V., 63
Chamberlain, J., 643
Chamberlin, M., 186
Chambers, R. W., 625, 716
Chan, S. K., 731, 737, 745, 776, 777
Chance, B., 40, 41, 42, 44, 45, 151, 155, 275, 280, 282, 283, 385, 477, 602
Chang, A. Y., 143
Chang, F. N., 676, 677, 679
Chang, H. C., 268
Chang, J. J., 610
Chang, M., 313, 314
Chang, S. H., 131, 132
Chang, Yu-Shang, 36, 526
Chang, Y-Y., 306, 311, 313
Changeux, J-P., 94, 97, 269, 361, 362, 390, 391, 396, 397, 398
Chao, F. C., 393, 444
Chao, L., 779
Chaplain, R. A., 534
Chapman, J. A., 464
Charache, S., 753
Chargaff, E., 120, 123, 430
Charmbach, A., 112
Chase, A. M., 601, 602
Chase, L. R., 165, 168
Chasin, L. A., 89
Chatt, J., 351
Chauvet, J., 702
Chelack, W. S., 484
Cheldelin, V. H., 310
Chen, C. C., 701
Chen, D., 645, 654
Chen, P. Y., 468
Chen, R. F., 271
Cheng, T., 372
Cheniae, G. M., 306
Cherayil, J. D., 781
Cherest, H., 89
Cherkes, A., 680
Chervenka, C. H., 700, 702
Cheung, W. Y., 153, 155, 156
Chi, Y. M., 150, 152, 155, 168
Chiancone, E., 394, 754
Chiappino, G., 504
Chiba, H., 705
Chibnall, A. C., 717
Chi'en, J. L., 275, 293
Child, F. M., 523, 525
Childers, L. G., 114, 126
Chin, R. K., 772
Chipman, D. M., 365

Cho, K. Y., 467
Chock, P. B., 676
Choi, S., 577, 579
Chojnacki, T., 307
Chow, R. B., 702, 703
Chramback, A., 219
Christen, P., 704
Chung, A. E., 323
Chung, C-S., 529, 535
Church, B. D., 53, 54, 58, 59, 64, 65
Church, R., 650
Chytil, F., 153, 154
Cier, A., 676
Cioli, D., 499, 501, 761, 762, 769
Civen, M., 154
Claesson, S., 3, 10
Clancy, J. W., 153
Clark, A., 661, 662, 666, 667, 681
Clark, A. A., 385
Clark, A. J., 183, 184, 186, 187, 412, 424
Clark, B. F. C., 132, 133, 776
Clark, D. J., 416
Clark, J. M., Jr., 143
Clark, J. R., 701
Clark, M. J., 98, 227
Clark, R., 526, 533
Clark, R. E., 286
Clark, W. R., 645
Clayton, R. B., 304, 672, 684, 685
Clegg, J. B., 33, 750, 753, 757, 762, 766, 780, 781
Cleland, W. W., 201, 306, 671
Clever, U., 641, 645, 647, 648
Cline, A. L., 413, 424, 780
Coffey, D. S., 372
Cohen, C., 41, 526, 530, 531, 532, 533, 534
Cohen, G. N., 79-108; 83, 85, 86, 87, 88, 89, 92, 98, 392, 414, 424
Cohen, J., 547
Cohen, J. A., 28
Cohen, L. A., 695-726; 704, 711, 712, 716, 717, 718
Cohen, L. B., 528
Cohen, M., 319, 414, 415, 417, 429
Cohen, P., 282
Cohen, R., 56, 57
Cohen, S., 421, 498, 500, 502, 759, 760, 761, 768
Cohen, S. N., 144
Cohen, W., 47
Cohen-Bazire, G., 414
Cohn, C., 151, 155
Cohn, M., 370, 381, 389, 498, 499, 513, 514, 759, 762, 768, 771, 772
Cohn-Bourgeois, S., 416
Colberg, J. E., 504
Cole, R. J., 635
Coles, W. C., 373
Collier, J. R., 641, 642
Collman, J. P., 335, 353
Colman, R. W., 735
Colodzin, M., 313
Colombo, B., 780
Colowick, S. P., 384
Comb, D. G., 110, 111
Comings, D. E., 773
Condon, E. U., 455, 456
Connell, G. E., 706, 708, 774, 775
Connell, J. J., 530
Connellan, J., 236
Connelly, C. M., 275, 280
Conover, M., 464
Conover, T. E., 470, 529
Conrad, H. E., 626
Constantopoulos, G., 319, 677, 678, 679
Contesse, G., 426
Conway, A., 395, 718
Cook, K., 309
Cook, R. A., 201
Coombe, R. G., 682
Coombs, T. L., 716
Coon, H. G., 634
Coon, M. J., 676
Cooper, D. Y., 672, 673, 674, 675, 676
Cooper, J. M., 101
Coore, H. G., 166
Copley, M., 275, 293
Coppola, J. C., 26, 33, 39, 363, 367, 382
Cordaro, J. C., 423
Cordes, E. H., 360, 367, 373
Corey, E. J., 625, 683, 684, 685
Corey, R. B., 28, 39
Cori, C. F., 155, 167, 263
Corley, L., 36
Cormick, J., 750
Cormier, M. J., 597, 608, 609, 610, 612, 614, 615, 616, 617, 618, 619, 624
Cornblath, M., 157
Cornforth, J. W., 683
Cornforth, R. H., 683
Costa, E., 152
Costea, N., 759
Costilow, R. N., 59, 232
Cota-Robles, E. H., 465
Cotterill, J., 533, 537
Cotton, F. A., 36
Cotton, R. G. H., 98, 100, 105
Coulombre, J., 610
Coulson, W. F., 565
Coultate, T. P., 279
Courtade, S., 312
Cousineau, G. H., 642
Covelli, I., 65, 711, 712
Cowan, J. C., 709
Coward, S. J., 646
Cowie, D. B., 415
Cox, D. J., 393
Cox, D. P., 65, 66
Cox, E. C., 112, 113, 124, 125
Cox, J., 26, 42, 382, 746, 747
Cox, R. M., 334
Cozzarelli, N. R., 421
Craig, J. W., 161, 162, 167
Craig, L. C., 498, 501, 762, 763, 764, 766
Cram, D. J., 377
Cramer, F., 144
Crane, F. L., 476, 477
Crane, R. K., 259, 275, 292, 293, 294
Crapo, L., 415
Crasemann, J. M., 427
Craven, G. R., 416
Crawford, I. P., 100, 101, 103, 105, 393, 423, 426, 730
Creange, J. E., 163
Creighton, T. E., 102, 104
Cremona, T., 705
Crestfield, A. M., 33, 46, 365, 372, 706
Cribbs, R., 418
Crick, F. H. C., 39, 135, 143, 144, 190, 772, 773, 776
Criddle, R. S., 306, 468, 469
Crippa, M., 645
Crocco, R. M., 162
Crocken, B. J., 309
Crockford, P. M., 166
Crone, H. D., 307, 322
Cronenwett, C. S., 94, 95
Cronin, J. R., 35, 745
Cross, M. J., 236
Crowfoot, D., 36, 47
Crumpton, M. J., 39, 510
Cuatrecasas, P., 709
Culbertson, J. R., 523
Cullen, J., 324
Cullis, A. F., 26, 40, 363
Cumar, F. A., 250
Cunningham, L. W., 711
Curphey, T. J., 683
Curtain, C. C., 773, 775
Curtis, P. J., 677
Cusachs, L. C., 599
Cushman, D. W., 676
Cushman, P., 163
Cusic, M. E., 381
Cutler, R. G., 122

Cuzin, F., 188, 479
Czihak, G., 644

D

Dacie, J. V., 753
Dagely, S., 119
Dagg, C. P., 211
Dahlquist, F. W., 365
Dahmus, M. E., 647, 648
Dameshek, W., 514
Danforth, W. H., 274
D'Angeli, F., 700
Daniel, L. J., 308
Danielli, J. F., 473, 483
Dankert, M., 472, 473
Darby, T. D., 161
Dark, F. A., 55
Darnell, J. E., 648, 650
Darwish, D., 377
Das, P. K., 351
Das Gupta, B. R., 707, 716
Datta, P., 86, 93, 94
Dauterman, W. C., 310
Davenport, D., 603
Davern, C., 114
Davidson, B., 446, 447
Davidson, E. H., 643, 645
Davidson, N., 676
Davidson, O. W., 645
Davidson, R. L., 651
Davidson, S. J., 671
Davie, J. M., 512
Davies, B. D., 124
Davies, D. R., 40, 363, 446, 746
Davies, J., 415, 416
Davies, J. E., 124
Davies, J. I., 150, 154, 158, 159, 160
Davies, R. E., 535, 536
Davies, V., 527
Davis, J. J., 294
Davis, R. H., 203
Davis, W. W., 162, 280
Davison, C., 182
Davison, J., 419
Davoren, P. R., 152
Davson, H. A., 473
Dawid, I. B., 639
Dawidowicz, E. A., 481
Dawson, R. M. C., 304, 313, 314, 322, 323
Dayhoff, M. O., 775
Dean, P. D. G., 684
Debavadi, C. S., 211
de Bruijn, H., 625
Debuch, H., 307, 310, 314, 315, 316
Decker, G. L., 481, 483
Decker, K., 92
Dedman, M. L., 715
DeDuve, C., 261
Deffner, G. G. J., 554
DeFlines, J., 676
de Gasquet, P., 286
de Gier, J., 489, 490
de Haan, P. G., 427
De Haan, R. L., 634
de Haas, G. H., 310, 311, 312, 320, 322
de la Fuente, G., 281
Delaney, R., 498, 499, 712, 760, 762, 767, 768
DeLange, R. J., 35, 151, 155, 158, 772, 779
Delbauffe, D., 320
Del Castillo, J., 486
Delihas, N., 140
Delisle, G., 290
Delius, H., 112
Dellweg, H., 177, 415
de Loze, C., 447
DeLuca, M., 385, 604, 605, 606, 607
DeMaeyer, L., 386
Demerec, M., 423, 427
DeMoss, J. A., 101, 102, 103
Dempsey, W. B., 372
Dénes, G., 97
Denhardt, D. T., 177, 184
Denis, H., 644
Dennis, A., 689
Dennis, D. T., 279
Dennis, E. S., 56, 59
Denny, P. C., 651
Denton, R. M., 160, 168, 269, 288, 292
Denton, W. L., 778
DePetris, S., 465
De Petrocellis, B., 216, 219
Depinto, J. A., 312
Depue, R. H., 536
Deranieau, D. A., 452
DeRobertis, E., 152, 153
de Robichon-Szulmajster, H., 88, 89, 94, 95
Dervartanian, D. V., 673
DeSa, R., 619, 620, 621
DeSalles, L., 152, 169
Desaulles, P. A., 162
Deshmukh, K., 565, 566
Desnuelle, P., 27
de St. Groth, F., 504
Desveaux-Chabrol, J., 645
de Thomás, M. E., 321
de Torrontegui, G., 155, 165, 279, 310
Detroy, R. W., 333, 334
D'Eustachio, A. J., 333, 334, 336, 337, 340, 341, 342, 344, 345, 346
Deutsch, H. F., 501, 759, 767
Deutscher, M. P., 51-78; 56, 57, 58, 59, 60, 63, 64, 66
DeValeet, J., 111
De Vijder, J. M., 395
DeVoe, H., 113, 587
Devoret, R., 189
DeVries, J. K., 418
Dewey, K. F., 413
Dewey, M. M., 478
Dexter, D. L., 577
Deyl, Z., 554
de Zalenski, C., 385
Dhalla, N. S., 156, 157
Diamond, J., 158
Diamond, J. M., 750
Diamond, R., 40, 44, 452
Diana, A. L., 481, 483
Di Berardino, M. A., 639
Dickerman, H., 91, 225, 236, 237
Dickerson, R. E., 26, 34, 39, 363, 369, 448, 745, 746
Dieckmann, M., 138
Dierks, C., 255
Dils, R. R., 322
Dilworth, M. J., 237, 239, 241, 334, 335, 340, 342, 344, 345, 346, 348, 351
Dimmock, M. O., 750, 758
Dintzis, H. M., 36, 413, 750
DiPietro, D. L., 259, 261, 279, 293
Distler, J., 319
Ditmars, N. E., Jr., 590
Dittmer, J. C., 310, 314
Dixon, G. H., 372, 715, 774, 775
Dixon, J. S., 778
Dixon, J. W., 712
Dobbins, J., 320
Dobbs, M. M., 750, 751
Doctor, B. P., 145, 776
Dodd, P., 151, 155
Dodson, R. M., 680
Doerfler, W., 183
Doi, R. H., 54, 56, 57, 58, 59, 63, 64, 65, 111
Dolbeare, E. A., 192
Dolphin, D. H., 238
Donato, L., 711, 712
Donnellan, J. E., Jr., 63, 178
Donninger, C., 683
Donovan, J. W., 46
Doolittle, R. F., 499, 506, 507, 515, 516, 735, 744, 762, 768, 772, 777, 779, 780
Dorfman, A., 558, 567
Dorfman, R. I., 671, 677, 678, 679
Dorner, M., 451
Dorrington, J. H., 163
Dorrington, K. J., 502
Dorsey, J. A., 306
Doscher, M. S., 44, 45, 385, 708
Doty, P., 46, 113, 178, 366,

413, 445, 446, 447, 448, 452, 454, 644
Douce, R., 322
Doudoroff, M., 85, 87, 89, 370, 624
Douthit, H. A., 57
Douzou, P., 575, 581
Dowben, R. M., 530, 647
Doy, C. H., 97, 101, 467
Dozy, A. M., 754
Drabikowski, W., 528
Drahovsky, D., 415
Drake, M. P., 554
Drapeau, G. R., 103, 729
Dray, S., 501, 502, 504, 505
Dreizen, P., 521, 529, 530
Drenth, J., 26, 35, 39, 363, 448
Dressler, D., 184
Drews, G. A., 535
Dreyer, W. J., 27, 367, 498, 499, 500, 701, 729, 762, 763, 764, 766, 768, 769, 771, 772, 773
Dreyfuss, J., 478
Driscoll, J. N., 598
Driscoll, J. S., 598
Drisko, R. W., 372
Drobnik, J., 587
Drummond, D. S., 589
Drummond, G. I., 153, 156, 157
Drummond, G. O., 264
Dua, R. D., 338, 339
Duane, W., 611, 612, 616
Dube, S. K., 45, 712
Dubin, D. T., 110, 111, 117, 119, 120
Dubnau, D., 111, 122, 124
DuBus, R., 626
Duffield, P. H., 202
Dular, R., 334
Duncan, L., 156, 157
DuPraw, E., 56, 57, 59, 62, 63
Dupré, J., 168
Duraiswami, S., 208, 233
Durante, M., 549
Dure, L. S., 615, 616, 617, 618, 619, 624
Durham, L. J., 234
Durwald, H., 192
Dus, K., 731, 776
Duspiva, F., 214
Dütting, D., 131, 132, 133, 135, 136, 137, 144, 146
Dutton, A., 703

E

Eagan, J. B., 479
Earle, A. S., 260, 293
Easley, C. W., 759, 761, 767
Eastlake, A., 36
Eaton, W. A., 45, 46
Ebashi, F., 527, 528
Ebashi, S., 526, 527, 528, 537
Ebert, J., 634, 637, 641
Ebner, K. E., 778
Echols, H., 187, 413, 420, 424, 425, 428, 429, 430
Eck, R. V., 775
Eckel, E., 124
Ecker, R. E., 124
Eckert, R., 619
Eckroade, C. B., 609
Edelhoch, H., 711
Edelman, G. M., 498, 499, 505, 517, 761, 767, 768, 771, 772
Edelman, I. S., 164
Edelman, J. C., 161
Edelman, P. M., 161
Edelstein, L., 634
Edman, P., 516, 735, 750, 762, 769
Edmundson, A. B., 748
Edsall, J. T., 37, 38, 46, 448, 449, 451
Edwards, A. M., 672
Edwards, C., 536
Edwards, D. L., 468
Edwards, J. M., 100, 101, 391
Edwards, R. G., 635
Edwards, W. C., 750, 751
Edwards, W. E., 750, 758
Efron, M. L., 753, 754
Egan, A. F., 101
Egan, J. B., 183
Eger-Neufeldt, I., 272, 273, 290
Eggleston, L. V., 269, 271, 283, 291, 296
Eggman, L., 539
Eguchi, G., 521, 522
Eguchi, S., 600, 601
Ehrenberg, A., 337, 385, 732, 744, 745
Eidlic, L., 119, 425
Eigen, M., 386, 389, 394
Eik-Nes, K. B., 670
Ein, D., 761, 762
Eisen, H. N., 504, 505, 508, 509, 512, 514
Eisenberg, D., 26, 34, 39, 363, 448, 745
Eisenberg, E., 533, 534
Eisenberg, S., 321
Eisenstein, A. B., 287, 291
Eisenstein, R. B., 422
Eisentraut, A. M., 166, 168, 288
Eisinger, J., 573, 574, 575, 576, 577, 580, 581, 582, 583, 585, 586, 587
Eisner, E., 603
Eisner, T. H., 603
Eker, P., 214
El-Bayoumi, M. A., 573
Elder, R., 192
Elkort, A., 117, 120
Ellfolk, N., 337
Ellingboe, J., 316, 317
Elliott, A., 447
Elliott, G. F., 536, 537
Elliott, S. D., 779
Ellis, C. H., 652
Ellis, M. E., 308, 466
Ellison, S. A., 179
Elsaesser, S., 282
Elsbach, P., 322
Elsden, D. F., 558, 559, 561, 565, 567
Elson, D., 114
Emanuel, N. M., 575
Emerson, M., 526
Emmelot, P., 474
Emmerson, P. T., 182, 184
Emrich, J., 144, 190, 413, 729, 773
Endo, M., 527
Engel, L. L., 670, 671
Engelberger, F. M., 506
Engelhardt, D. L., 427, 777, 780
Engelhardt, V. A., 522, 524
Engelman, D., 476
Englander, J. J., 144
Englander, S. W., 144, 530
Englard, S., 266, 395, 454
Englberger, F. M., 711, 712
Engle, J., 452
Engle, R. R., 372
Engle, W. K., 535
Englesberg, E., 418, 419, 427
Engstrom, L., 372
Ennis, H. L., 119, 123
Ensinck, J. W., 166
Ensor, J. M., 168
Eoyang, L., 143
Ephrussi, B., 651
Eppstein, S. H., 672, 682
Epstein, C. J., 363, 729, 776
Epstein, R. H., 425
Epstein, W., 411-36; 413, 416, 427, 428
Erbland, J., 309, 322, 466, 467
Ericsson, L. H., 780
Erlander, S. R., 522
Erlanger, B. F., 47, 504
Erman, J. E., 383, 386
Ermishkin, L. N., 486
Ermolaev, V. L., 578
Ernback, S., 17

Ernster, L., 675
Erwin, M. J., 711, 712
Eschenmoser, A., 683, 685
Eskin, V. E., 447
Estabrook, R. W., 672, 674, 675, 676, 736
Evans, D. F., 578
Evans, H. J., 333, 334, 335, 337, 338, 341, 343, 344, 345, 346, 348
Evans, J. E., 122
Evans, R. L., 702
Evans, S. A., 31
Evans, W. H., 772, 779
Even-Shoshan, A., 95
Everett, G. A., 131, 132, 135, 136, 146
Ewald, W., 670
Exton, J. H., 150, 151, 154, 161, 251, 255, 257, 272, 277, 286, 287, 288, 289, 291, 295
Eylar, E. H., 702
Eyring, H., 441, 455, 456

F

Facon, M., 502
Fahey, J. L., 502, 759
Fahien, L., 395
Faiman, L., 143
Falaschi, A., 59, 62
Falbriard, J. G., 168
Falcone, G., 65
Falconer, I. R., 168
Falcoz-Kelly, F., 88
Fales, H. M., 676
Fall, C., 400
Fall, L., 205
Fambrough, D., 647, 648
Fan, D. P., 123
Fanburg, B., 525
Fanger, M. W., 35, 699, 745
Fankuchen, I., 28
Fansler, B. S., 117, 120, 121, 123
Farah, A., 157, 164
Farber, L., 716
Fare, L. R., 682
Fareed, G. C., 195
Farese, R. V., 163
Faris, B., 558
Farkas, W., 89
Farley, J. W., 192
Farmer, T. H., 715
Farquhar, J. W., 315
Fasella, P., 373
Fasman, G. D., 46, 441, 446, 447, 451, 454
Fasold, H., 702
Fassina, G., 158, 159, 164, 168
Fastie, W. G., 605, 608
Faulkner, R. D., 131, 132
Faure, M., 322
Fawcett, D. W., 647
Fay, P., 334
Federighi, G., 711, 712
Feeney, R. E., 701, 705, 714
Feigelson, M., 288
Feigelson, P., 288
Feiner, R. R., 179
Feinstein, A., 501
Feinstein, D., 760
Feinstein, M., 153, 162, 163
Feizi, T., 513
Feldmann, H., 131, 132, 133, 135, 136, 137, 144, 145, 286
Fell, P. E., 634
Feller, D. R., 160
Fellows, R. E., 498, 499, 760, 762, 767, 768
Felsenfeld, G., 144, 586, 587
Felts, P. W., 154, 286
Fennessey, P., 472, 473
Fenton, J. W., 515, 516
Ferdinard, W., 400
Ferguson, J. J., 162, 163
Fernandez, M. D. C. G., 167
Fernández-Morán, H., 476, 477
Ferrandes, B., 55, 464, 465, 466
Ferrell, W. J., 316
Few, A., 464
Fiala, A. E., 217, 219
Fiala, S., 217, 219
Field, G. F., 604
Field, V. L. S., 536
Filira, F., 700
Filmer, D., 396, 397, 399
Finch, J. T., 36, 113
Finck, H., 529
Finesilver, A., 188
Finger, K. F., 160
Fink, G. R., 422
Finkel, R. M., 525
Finkelstein, A., 463-96; 484, 485
Finn, A. L., 164
Firemark, H., 310
Fischer, E., 380
Fischer, E. H., 274, 372, 392
Fischer, G. A., 211
Fischman, D. A., 646
Fiscus, W. G., 309
Fisher, D. J., 333
Fisher, E. A., 251, 252, 259, 269, 270, 283, 291, 295
Fisher, J. N., 160
Fitch, W. M., 729, 731, 732, 733, 734, 735, 741, 742, 743, 744, 755, 773, 774, 775, 776, 778, 779, 780
Fitz-James, P. C., 55, 56, 57, 68, 70, 464
Flaks, J. G., 112, 113, 124, 125
Flatness, S., 287, 291
Flavin, M., 88, 89, 90
Flechon, J., 56, 70
Fleischer, B., 314, 474
Fleischer, S., 314, 468, 470, 471, 474, 475
Fleischman, J. B., 36, 498, 759, 761
Fleming, J. S., 230
Fleming, W. H., 219
Flickinger, R. A., 638, 644, 646
Flodin, P., 16
Flöhl, R., 415
Flory, P. J., 37, 38
Foa, P. P., 150
Focesi, A., 227
Fodor, I., 136, 145
Foell, T., 677
Foerster, G. E., 606, 617, 618
Fogarty, A. C., 324
Fogg, G. E., 332, 334
Folk, J. E., 735
Folkers, K., 225
Fonken, G. S., 677
Fontana, A., 708
Foote, C. S., 625
Forchhammer, J., 121
Forget, B. G., 137
Foroff, O., 672, 675
Forsham, P. H., 166
Förster, I., 576, 578
Foster, D. O., 252, 255, 268, 269, 270, 286, 287, 288, 291
Foster, J. F., 522
Foster, J. W., 54, 56, 68, 70, 71
Foster, M. A., 236, 239, 241
Foster, R., 160
Foster, R. J., 46, 384, 451
Fournier, D. V., 214
Fowler, J. F., 333, 334
Fox, C. F., 111, 122, 413, 416, 428, 479
Fraenkel, D. G., 478
Fraenkel-Conrat, H., 143, 697, 711, 712, 729, 773
Frame, R., 419
Francis, M. J. O., 312
Frangione, B., 767
Frankel, R. F., 452
Frankel, S., 481
Franklin, E. C., 513, 760, 767
Franklin, J. E., Jr., 216

Franklin, N. C., 186, 425
Franq, J., 575
Frantz, I. D., Jr., 683
Franzblau, C., 558, 559
Fraser, R. D. B., 447
Frater, R., 779
Frauenberger, G., 505
Fredericq, H., 158
Freedberg, W. B., 421
Freedman, A. D., 267, 272, 287, 291
Freedman, M. H., 506
Freedman, M. L., 638
Freeman, K., 469, 470
Freer, J. H., 464
Freer, S., 322
Freer, S. T., 26, 27, 30, 40, 41, 367
Freese, E., 59, 61, 62, 176
Freese, E. B., 176
Freifelder, D., 177, 182
Freimer, E. H., 464
French, D., 389
Frenkel, R., 282, 283
Frensdorff, A., 708
Frenster, J. H., 646, 647, 648
Fresco, J. R., 113, 144, 441
Freundlich, M., 381, 425
Frey, P. A., 229, 230
Friberg, U. A., 556, 557
Fridborg, K., 26, 34, 39, 41, 43, 363, 448
Fried, J., 682
Friedberg, S. L., 152, 155, 168
Frieden, C., 201, 400
Friedland, J., 610, 611, 614, 615, 616
Friedman, D. L., 167
Friedman, J. P., 676
Friedman, S., 237, 240, 241
Friedmann, B., 261, 289
Friedmann, N., 150, 154, 291
Fritz, I. B., 154, 290
Frohwirt, N., 745
Fromm, H. J., 275, 293, 535
Fronticelli, C., 452
Fruchter, R. G., 706
Fruton, J. S., 708
Fry, B., 637
Fuchs, S., 646, 653, 709
Fudenberg, H. H., 513, 759
Fuerst, C., 176, 177
Fujimura, R., 114
Fujio, H., 504
Fukui, K., 57
Fukui, S., 228, 229, 233,
Fulk, G. E., 59
Fuller, W., 144
Fullner, H. M., 559, 563, 565
Fulton, M., 522
Fung, C. H., 290
Furano, A. V., 114, 126
Furfine, C., 281, 395
Furminger, I. G. S., 529

G

Gabrio, B. W., 219, 220
Gadd, R. E. A., 212
Gaddone, S. M., 711, 712
Gaetjens, E., 528, 529, 530, 535
Gaffney, P. J., 753
Gagloiev, V. N., 591
Gaines, K., 413
Galansino, G., 150
Galibert, F., 110, 111
Gall, J. G., 640, 650
Gallant, J., 424, 429
Galley, W., 46
Gallop, P. M., 548, 549, 552, 555, 556
Gallucci, E., 143
Gally, J. A., 498, 499, 761, 768, 771, 772
Gamache, E., 153
Gammack, D., 476
Ganesan, A. K., 185, 414
Ganesan, A. T., 479
Garcia, A., 288
Garcia-Rivera, J., 346, 350
Gardiner, W., 208, 209, 233, 236
Gardner, R., 59, 60, 62, 66
Garen, A., 143, 424, 776
Garen, S., 424
Garland, P. B., 260, 269, 273, 288, 290, 292
Garner, H. R., 86
Garren, L. D., 162
Gartland, W. J., 144
Gartner, T. K., 421
Gascoyne, T., 255, 266, 286, 288
Gates, V., 365
Gatt, S., 320
Gavrilova, L. P., 113, 114, 118
Gefter, N. L., 194, 195
Gehring-Müller, R., 750
Geiduschek, E. P., 179, 413, 425
Geisser, S., 768, 771, 772
Gelehrter, T., 645
Gell, P. G. H., 501, 504, 505
Gellert, M., 186, 194
Gellert, M. F., 530
Gellhorn, A., 648
Gelman, R. A., 316
Gent, W., 476
Gentry, G. A., 211
George, J., 189
George, P., 676
Georgiev, G. P., 649
Geraci, G., 216, 217, 218
Gerald, P. S., 752, 753, 754, 772
Gerber, B. R., 522
Gergely, J., 521, 528, 529, 531, 533, 534, 535
Gerhardt, P., 55, 56, 70
Gerhart, J. C., 151, 390, 391
Germaine, G. R., 428
Germershausen, J., 105
Gerring, M., 365
Gershman, L. C., 529, 530, 601, 602
Gertler, A., 712
Gerwing, J., 709
Geschwind, I. I., 702
Gest, H., 94, 343
Gesteland, R. F., 113, 114, 425
Gevers, W., 268, 270, 271, 276, 283, 284, 286, 290, 296
Ghambeer, R. K., 208, 210, 234, 235, 236
Ghosh, A., 280, 282
Ghosh, H. P., 250
Ghosh, S., 478
Gibbons, I. R., 521-46; 523, 524, 525
Gibbons, N. E., 318, 466, 467
Gibson, D. T., 681
Gibson, F., 98, 100, 101, 105, 391
Gibson, Q. H., 389, 394, 602, 610, 611, 612, 614, 615, 616, 753, 754
Gilbert, W., 109, 415, 416, 417, 430
Gilbert, W. R., Jr., 205
Gilbertson, J. R., 316
Gilby, A., 464
Giles, H. N., 393
Gilgan, M. W., 153
Gilham, P. T., 142, 143
Gillette, J. R., 676
Gilman, A. G., 150, 168
Gilmour, R. S., 646
Gilvarg, C., 60, 71, 89
Gingery, R., 187
Ginoza, W., 176, 177
Ginsburg, A., 81
Giordano, M. G., 470, 471
Giovanelli, J., 324
Giovenco, M. A., 470, 471
Giovenco, S., 470, 471
Girard, M., 648
Givas, J., 510
Givol, D., 767
Gladner, J. A., 372, 735

Glansdorff, N., 203, 424, 427
Glass, J., 382
Glatzle, D., 243
Glauert, A. M., 477, 522
Glauser, S. C., 754
Glazer, A. N., 449, 450, 451, 522, 737, 776, 779
Glende, E. A., 295
Glick, M. C., 465
Glimcher, M. J., 547, 556, 557
Glišin, M. V., 644
Glisin, V. R., 178
Glomset, J. A., 320
Goad, L. J., 685, 688, 689
Godfrey, J. E., 528
Godley, W. C., 751
Goebel, W., 98, 99, 100
Goffart, M., 156
Gogo, T., 600, 601
Goh, S. M., 504, 507
Goidl, J., 647
Gold, A. H., 709
Gold, A. M., 703, 704
Goldberg, B., 634
Goldberg, M. E., 104, 105
Goldberg, M. L., 648
Goldberger, R. F., 363, 428, 699, 700, 729
Goldfarb, A. R., 705
Goldfine, H., 303-30; 305, 306, 307, 308, 315, 316, 323, 466
Goldman, D. S., 201
Goldman, I. M., 166
Goldman, M., 59, 64, 65
Goldstein, A., 413
Goldstein, J., 111, 750
Goldstein, L., 531, 532, 533, 534, 638, 639
Goldstein, M., 666
Goldstone, A., 737
Goldthwaite, C., 124
Goldwasser, E., 654
Goloukina, L. S., 318, 324
Golov, V. F., 114, 118
Gonano, F., 781
Goodman, E. H., 261, 289
Goodman, H., 132
Goodman, H. M., 132, 133, 160
Goodman, R. M., 647
Goodridge, A. G., 161
Goodwin, T. W., 685, 688, 689
Goodyear, J., 243
Gorbunoff, M. J., 445, 446, 705, 706
Gorchein, A., 307, 312
Gordon, J., 110, 121
Gordon, W. G., 716
Gorini, L., 424, 426
Goto, T., 600, 601, 605
Gottesman, M. M., 234
Gouaux, J., 319
Gould, B. S., 647
Gould, E. S., 377
Gould, G. W., 54, 55, 56, 59, 65
Gould, M., 194, 195
Gould, R. M., 311, 312
Goulian, M., 195, 208, 209, 210, 233, 236
Gounaris, A. D., 699
Gouterman, M., 44
Gouvea, M. A., 529, 531, 534
Graber, A. L., 167
Grabow, W. O. K., 90
Grabowich, P., 682
Graff, S., 272
Graham, C. F., 638
Grahame-Smith, D. G., 150, 151, 154, 162
Granick, S., 780
Granner, D., 645
Grant, P., 219
Grantham, J. J., 164
Grasso, S. G., 166
Gratzer, W. B., 443, 445
Grau, F. H., 334
Graves, D. J., 274, 704
Graves, J. M. H., 661, 662, 666, 667, 681
Gray, C. T., 343
Gray, G. D., 154
Gray, G. M., 310
Gray, M. W., 137, 138, 139
Gray, W. R., 498, 499, 500, 703, 762, 763, 764, 766, 768, 769, 771, 772
Grayzel, A. I., 780
Grazi, E., 372, 700, 705
Graziosi, F., 413
Green, A. A., 600, 604, 612
Green, C., 467
Green, D. E., 468, 469, 470, 471, 473, 475, 476, 477
Green, H., 634
Green, I., 505, 507, 534, 535
Green, J. H., 59, 62
Green, M., 413
Green, N. M., 449, 451, 697, 704
Green, W. A., 534
Greenawalt, J. W., 481, 483
Greenberg, D. M., 308
Greenberg, H., 648, 649
Greene, R., 644
Greenlee, L., 704, 705
Greenspan, C. M., 413
Greenspan, G., 677
Greenwood, C., 614
Gregson, N., 476
Grenson, M., 203
Greville, G. D., 489, 490
Grey, H. M., 502, 760, 767
Grey, T. C., 527
Griffiths, D. E., 267, 276, 470
Grimstone, A. V., 524, 536
Grisaro, V., 365
Grisolia, S., 136
Grist, K. L., 704
Grobstein, C., 547, 634
Grodsky, G. M., 155, 166
Gröndahl, N. J., 735
Grönwall, S., 11
Gros, F., 124, 425, 426
Gross, J., 416, 550, 551, 552, 556, 557, 563, 564, 566
Gross, J. D., 188
Gross, P. R., 631-60; 634, 637, 640, 641, 642, 643, 644, 645, 646, 648, 651, 652, 729
Gross, S. K., 684, 685
Grossberg, A. L., 510, 701, 714
Grossman, L., 192, 441
Grossman, M. I., 168
Groth, D. P., 210
Groves, J. T., 683
Grubb, R., 501
Grunberg-Manago, M., 176
Guarino, D. U., 219
Guéron, M., 571-96; 573, 574, 575, 576, 577, 580, 581, 582, 583
Guest, J. R., 92, 103, 236, 237, 240, 241, 413, 729
Guidotti, G., 394, 708, 754
Guirard, B., 370
Gulbenkian, A., 153
Gulyassy, P. F., 164
Günalp, A., 110, 111, 120
Gundersen, W., 424
Gundlach, G., 372, 703
Gunsalus, I. C., 626, 673, 676
Gunter, C. R., 360
Gunther, C. R., 717
Gurd, F. R. N., 702, 706
Gurdon, J. B., 638, 639, 641, 648
Gurin, S., 679
Gürtler, K. F., 214
Gussin, G. N., 780
Gussin, R. Z., 164
Gustafson, T., 634
Gustavson, K. H., 549
Gut, M., 677, 678, 679
Gutfreund, H., 373
Guthrie, C., 735
Guthrie, S., 191
Guttman, B. S., 425

H

Haag, U., 290
Haake, P. C., 376
Habeeb, A. F. S. A., 699, 702, 705
Haber, E., 497-520; 506, 509, 510, 512, 515, 701
Haber, J. E., 396, 397, 398, 399
Hachimori, Y., 706, 710, 711, 714, 715, 716
Hadfield, K. L., 342
Haeckel, R., 253, 271, 279, 282, 283, 285, 296
Hagen, J. H., 160
Hagen, P. B., 160
Hagen, P. O., 307, 308, 315, 316, 466
Hagenmaier, H., 334
Hager, S. E., 203
Hagyard, C. J., 529
Haines, J. A., 701, 704
Haines, T. H., 325
Hajra, A. K., 324
Haldar, D., 469, 470
Hales, C. N., 268, 269, 288, 292
Halkerston, I. D. K., 151, 153, 155, 162, 163
Hall, B. D., 113, 413
Hall, H. D., 165
Hall, P. F., 150, 151, 163, 670
Halliday, K. A., 715
Hallmann, I., 286
Halmann, M., 703, 704
Halpern, J., 676
Halpern, Y. S., 95
Halvorson, H. O., 52, 53, 54, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65
Hama, H., 528
Hamada, K., 424
Hamilton, C. L., 373
Hamilton, G. A., 676
Hamilton, P. B., 682
Hammam, A. S. A., 689
Hammermeister, K. E., 155, 156, 157, 168
Hammes, G. G., 366, 383, 386
Hammond, G. S., 373
Hampton, A., 216
Hanahan, D. J., 309, 467, 470
Hanai, T., 481, 483, 484
Hanawalt, P. C., 176, 182, 480
Hanby, W. E., 447
Hand, E., 702
Handler, J. S., 149, 150, 151, 158, 163, 164
Handler, P., 704, 705
Haneda, Y., 598, 602, 603
Hanifin, J. W., Jr., 676
Hann, C. S., 735
Hansen, R. E., 337, 673
Hansen-Delkeskamp, E., 214
Hanson, F. E., 608
Hanson, J., 522, 524, 528, 536, 537, 539
Hanson, R. S., 58, 59, 60, 64, 65, 66
Hanson, T. L., 295
Hanss, M., 575
Haraca, Y., 678
Harada, M., 705, 713
Harano, Y., 253, 269, 271, 279, 283, 285, 296
Harbury, H. A., 35, 699, 702, 745
Harding, J. J., 548
Hardman, J. G., 149, 153, 156
Hardman, J. K., 103
Hardman, K. D., 26, 31, 32, 37, 39, 40, 41, 43, 45, 363, 365, 366, 383, 515
Hardwick, B. C., 565
Hardwick, E. C., 717
Hardy, J., 207, 208, 210, 233
Hardy, R. W. F., 331-58; 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353
Hargie, M. P., 635
Harker, D., 26, 31, 39, 40, 41, 363, 366, 448, 509, 515
Harm, W., 176, 181, 185
Harrap, B. S., 447
Harrington, W. F., 529, 530, 532, 533, 534, 548, 556
Harris, C. I., 528, 533
Harris, H., 650, 651
Harris, J. B., 151
Harris, J. I., 112, 372, 395, 599
Harris, M., 529, 634
Harrison, A. P., 176
Harrison, D. M., 687
Harshman, S., 372
Hart, P., 321
Hart, R. G., 363, 746
Hartdegen, F. J., 365, 712
Hartley, B. S., 28, 372, 530, 699, 703, 704, 774, 779
Hartman, F. C., 47, 703
Hartman, P. E., 422, 479
Hartman, S. C., 385
Hartmann, G., 281
Hartree, E. F., 59, 65
Hartshorne, D. J., 526, 527, 529, 537
Hartsuck, J. A., 26, 32, 33, 34, 39, 41, 363, 367, 382
Hartwell, L. H., 430
Harvey, E. B., 645
Harvey, E. N., 483, 602, 610, 618, 622, 624
Haselkorn, R., 121, 124
Hashimoto, T., 57, 162
Hashimoto, Y., 673
Hashizume, H., 441, 443
Haskin, M., 472
Haslam, J. M., 267, 276
Hass, L. F., 699
Hasselbach, K., 393
Hasselbach, W., 527, 534
Hasselberger, F. X., 259, 277, 280, 281
Hassid, W. Z., 370
Hastings, J. W., 597-630; 597, 602, 603, 608, 610, 611, 612, 614, 615, 616, 619, 620, 621, 624
Hastings, R., 573, 575
Hatano, S., 529, 539
Hatfield, L. M., 717
Hathaway, A., 184
Hathaway, J. A., 283
Hathaway, P., 750, 751, 758, 780
Haugaard, N., 151, 156, 157, 161, 250, 274
Haugland, R. P., 46
Haurowitz, F., 386, 503
Hauschka, S. D., 547
Hausmann, E., 564
Havsteen, B. H., 29, 37, 46, 386
Hawkins, J., 158
Hawthorne, J. N., 313, 314
Hay, E. D., 641
Hayaishi, O., 153, 672
Hayano, M., 671, 675, 676, 677, 679, 680
Hayashi, A., 754
Hayashi, M., 413, 425
Hayashi, M. N., 413
Hayashi, N., 754
Hayashi, S., 421, 645
Hayashi, S. I., 119
Hayashi, T., 528, 529, 536
Hayashi, Y., 110, 111, 119, 120, 121
Haydon, D. A., 481, 483, 484
Haylett, T., 709
Haynes, R., 705
Haynes, R. C., 150, 151, 155, 162, 266, 287, 288, 290
Haynes, R. H., 181
Hayter, D., 527, 533, 537
Hayward, R. S., 111
Hazen, E. E., Jr., 36
Hechter, O., 151, 153, 155, 162, 163

Hedegaard, J., 205
Heidelberger, C., 219
Heim, T., 160
Hein, G. E., 373
Heinen, W., 337
Heinrikson, R. L., 706
Hélène, C., 581
Helinski, D. R., 393, 413, 729, 730, 772, 773, 780
Helleiner, C. W., 236
Heller, J., 735, 737, 745, 776
Heller, P., 759
Hellerman, L., 372
Helling, R. B., 419
Helmkamp, G. K., 335, 353
Helmreich, E., 155, 167, 274
Hemington, N., 323
Hemming, F. W., 686
Hems, R., 255, 257, 286, 288, 289, 290, 291, 295
Henderson, J. F., 205, 211, 212
Henderson, M. J., 273
Henderson, R., 26, 27, 29, 37, 40, 43, 363, 367, 448
Hengstenberg, W., 479
Henion, W. F., 168
Henley, D. D., 144
Henn, F. A., 481, 483
Henning, H. V., 267, 268, 279, 285, 286, 287, 288, 291, 296
Henning, U., 393, 413, 427
Henson, E., 555, 556
Heppel, L. A., 478
Herbert, E., 137, 138, 139
Heredia, C. F., 281
Heremans, J. F., 760
Heriott, R. M., 697
Hermier, J., 56, 59, 70
Hernandez, A., 275, 292, 293
Herr, M. E., 677
Herrera, M. G., 290
Herrmann, H., 529, 530
Herrmann, R. L., 203
Hers, H. G., 261
Herscovics, A., 205
Hershey, A. D., 194
Hertman, I., 187
Hertzman, E., 156
Herz, C., 427
Herzenberg, L. A., 414, 634
Hess, B., 253, 271, 276, 279, 282, 283, 285, 296
Hess, G. P., 29, 37, 46, 367, 383, 703
Hess, M., 762
Hess, M. E., 151, 156, 157, 250, 274
Hessel, B., 735
Hettinger, T. P., 35, 702, 745
Heusser, H., 683
Hewitt, R. R., 182
Heywood, S. M., 530, 647
Higa, A., 62, 63, 64, 123
Higa, H., 737
Higashi, S., 521, 529
Higashi, Y., 472
Higgins, J. J., 275, 280, 283
High, D. F., 26, 27, 30, 41
Highburger, J. H., 554
Higuchi, T., 472
Hildebrand, J. G., 317
Hilf, R., 162
Hilgetag, G., 677
Hill, A. V., 536
Hill, C. H., 565
Hill, D. L., 314
Hill, H. A. O., 351
Hill, J. A., 238
Hill, R. D., 703, 707
Hill, R. F., 179
Hill, R. J., 272, 750
Hill, R. L., 498, 499, 503, 702, 750, 757, 758, 759, 760, 762, 767, 768, 777, 778
Hill, W. C., 505
Hille, M. B., 377, 718
Hills, D. C., 119, 120, 123
Hilschmann, N., 498, 501, 746, 750, 762, 763, 764, 766, 774
Hilse, K., 746, 750, 774
Hilton, J. G., 163
Himes, M., 647
Himmelfarb, S., 530, 532, 533, 534
Hindennach, I., 644
Hinkson, J., 333, 338, 339, 344, 347, 350
Hinton, M., 735
Hiraga, S., 424
Hiraga, Y., 705
Hirata, M., 153
Hirata, Y., 600, 601, 605
Hird Convery, H. J., 284
Hirs, C. H. W., 365, 697, 698, 703, 704, 709
Hirsch, D. I., 750, 781
Hirschmann, H., 303, 318
Hirshfield, I. N., 163
Hirth, L., 685
Hitchins, A. D., 54, 55, 56, 59, 61, 65
Hjertén, S., 14
Ho, R. J., 155, 158, 159, 160, 168
Hoare, D. G., 708
Höber, R., 480
Hobom, G., 774, 750
Hoch, G. E., 343, 346, 347, 350
Hochstrasser, R. M., 45, 46
Hodge, A. J., 526, 554
Hodgkin, D. C., 225, 231
Hodgson, A., 144
Hodgson, E., 310
Hodgson, W. G., 351
Hoeniger, J. F. M., 70, 522
Hoffmann-Berling, H., 192, 522, 523
Hofmann, K., 777
Hofmann, T., 712
Hofschneider, P. H., 191
Hofstee, B. H. J., 376, 389
Hogenkamp, H. P. C., 225-48; 228, 229, 234, 235, 236, 238
Hogg, R. W., 95
Hogness, D. S., 183
Hohorst, H. J., 254
Hoijtink, G. J., 579
Hokin, L. E., 306
Hokin, M. R., 165
Hol, W. G. J., 35
Holbrook, J. J., 709
Holcomb, D. N., 586, 587
Holden, K. G., 682
Holeyšorský, V., 779
Holiday, E. R., 573
Holland, G., 293, 294
Holland, J., 124
Holley, R. W., 131, 132, 133, 135, 136, 144, 146
Hollingworth, B. R., 109
Hollins, R. A., 625, 716
Holloway, M. R., 697
Holmberg, E., 735
Holmes, I. A., 119, 120
Holmes, K. C., 113, 526, 538
Holmes, S., 634
Holmes, W., 275, 280
Holmgren, A., 206, 207
Holowczyk, M. A., 115, 122, 124
Holsten, R. D., 345
Holten, D. D., 268, 270
Holtzer, A., 526, 533
Holtzer, H., 634
Holtzer, S., 634
Holtzman, E., 648, 649
Holtzman, J., 676
Holwill, M., 521
Holz, G. G., 324
Holzer, H., 80, 81, 82, 281
Holzwarth, G., 445, 448, 454
Hommes, F. A., 282
Honda, H., 476
Hong, R., 762
Hood, L., 498, 499, 500, 762, 763, 764, 766, 768, 769, 771, 772

Hooper, N. K., 324
Hopkins, T. A., 599, 606
Horchner, P., 780
Horecker, B. L., 372, 472, 673, 700, 704, 705
Horhold, C., 681
Hori, K., 143, 608, 609
Hori, M., 212
Horie, H., 750
Horinishi, H., 705, 706, 710, 711, 713, 714, 715, 716
Horiuchi, S., 424
Horiuchi, T., 415, 424
Horn, V., 729, 773
Horne, R. W., 471, 477, 522
Horowitz, J., 113, 119, 120, 123, 430
Horowitz, N. H., 176
Horrocks, L. A., 315, 317
Horsfall, F., Jr., 7
Hörstadius, S., 634
Horton, B. F., 754, 777
Horton, H. R., 707, 718
Hoskinson, R. M., 131, 132
Hosokawa, K., 114, 119, 125
Hosokawa, M., 702, 705
Hostetler, K. Y., 263
Hotta, K., 532
Hotta, Y., 214, 638
Houston, L. L., 700
Houtsmuller, U. M. T., 311, 312, 466
Howard, A. N., 710
Howard-Evans, W., 35
Howard-Flanders, P., 175-200; 179, 180, 181, 182, 184, 185, 186, 187, 188, 189, 190
Howell, S. L., 167
Hsi, N., 230
Hsiung, L-M., 526
Hsu, W-T., 111, 122
Huang, C., 481, 483, 484
Huang, M-I. H., 650
Huang, P. C., 111
Huang, R-C. C., 647, 648
Hubbard, J. S., 83, 84, 391, 392
Hubbard, M., 645
Huber, G., 44, 365
Hübscher, G., 304, 307, 322
Hudson, L., 139
Huehns, E. R., 754
Huennekens, F. M., 219, 220, 236, 237, 239, 240, 241
Huether, H., 668
Huffman, R. E., 676
Hughes, R. C., 372
Hughes, R. R., 318
Hughes, W. L., Jr., 701, 702
Huijing, F., 167
Huisman, T. H. J., 746, 750, 751, 752, 754, 757, 758, 773, 774, 775, 777, 780, 781
Hull, D., 160
Hultin, H. O., 468, 469, 470
Humphreys, J. S., 83
Humphries, T., 653
Hunt, J. A., 142
Hunt, P. F., 686, 687
Hunt, S. V., 92
Hunter, E., 751, 753
Hunter, J. R., 58, 59, 61
Hunter, M. J., 702, 703
Huntsman, R. G., 746, 752, 772, 780
Hurlbert, R. B., 210
Hurst, J. J., 603
Hurwitz, J., 144, 194, 195
Hurwitz, L., 158, 168
Hutchinson, D. J., 211
Hutchison, H. E., 751, 753
Hütter, R., 103
Hutton, J. J., 777
Hutton, R. F., 370
Huxley, A. F., 536
Huxley, H. E., 526, 530, 532, 536, 537, 538
Hyatt, M. T., 59, 61
Hyndman, L. A., 343
Hynie, S., 150, 154, 158, 159, 160

I

Ichii, S., 678
Ichikawa, Y., 673
Ide, M., 169
Igarashi, R. T., 63, 111
Igawa, N., 750
Iijima, K., 56
Iino, T., 521, 522
Iitaka, Y., 447
Iizuka, I., 446
Ijlstra, J., 177
Ikawa, M., 304, 307, 308, 310
Ikeda, K., 732, 744
Ikeda, S., 335, 353, 447
Ikeda, Y., 111
Ikemoto, N., 533
Ikenaka, T., 705
Illarionova, N. G., 447
Imahori, K., 46, 441, 443, 447, 448
Imai, Y., 673
Imamato, F., 413, 423, 425, 426, 427, 428
Imamura, K., 534
Imura, H., 163, 168
Inada, Y., 706, 714
Inagami, T., 26, 31, 32, 37, 39, 40, 41, 43, 45, 363, 365, 366, 383, 515
Inano, H., 679, 680
Incefy, G. E., 286
Infante, A., 641, 643, 650, 651
Ingelman, B., 11
Ingraham, L. L., 245
Ingram, L., 194
Ingram, V. M., 137, 138, 144, 729, 750, 752, 755, 757, 758, 772, 773, 780
Inman, R. B., 191, 193, 575
Inoue, S., 600, 601, 605
Inoue, T., 70
Inouye, M., 144, 190, 413, 729, 773, 779
Inouye, S., 732, 744
Inselburg, J., 645, 654
Inward, P. W., 371
Iodice, A., 226, 227
Ipata, P. L., 704
Ippen, K., 413, 416, 417
Irias, J. J., 279
Irie, M., 710
Irion, E., 243, 244
Irr, J., 418, 419, 424
Irvine, D., 754
Isaacs, W. A., 753
Isbell, A. F., 318
Isemura, T., 447
Isenberg, I., 575, 584, 585, 586
Isham, K. R., 146
Ishida, T., 161, 163
Ishihama, A., 115, 118
Ishii, S., 699
Ishikawa, E., 393
Ishikawa, Y., 528
Ishikura, H., 135, 136, 137
Isoe, S., 716
Itano, H. A., 713, 714, 755
Ito, J., 101, 105, 423, 426, 427, 428, 729, 773
Ito, K., 203, 204, 424
Ito, M., 638
Itoh, T., 112, 113, 114, 118, 125
Iuchi, I., 752, 753, 754
Ives, D. H., 214
Iwabuchi, M., 110, 119, 120
Iwanaga, S., 735
Iwanov, D. A., 113
Iyer, V. N., 179
Izumi, Y., 57

J

Jackman, L. M., 100, 101
Jackson, E. K., 332, 333, 334, 335, 336, 339, 340, 341, 342, 343, 344, 345, 346, 347,

348, 349, 350, 351, 352, 353
Jackson, R. W., 102, 103
Jackson, W. T. H., 400
Jacob, E. J., 306
Jacob, F., 55, 92, 188, 269, 361, 390, 412, 413, 414, 415, 416, 417, 422, 424, 425, 427, 464, 479, 632, 655
Jacobs, A. S., 754
Jacobs, E. E., 736, 739
Jacobs, R. M., 714
Jacobsen, A., 735
Jacoby, G. A., 424, 510
Jacotot, B., 513
Jaenicke, L., 225, 236, 237
Jagannadha Rao, K. V., 312
James, A. T., 307, 308, 310, 319, 324
James, T. N., 157
Jamieson, D., 282
Jandl, J. H., 452
Jandorf, B. J., 704
Janin, J., 87, 88
Janion, C., 136
Jansonius, J. N., 26, 35, 39, 363, 448
Janssen, E. T., 320
Jaquet, H., 761
Jarvis, J. M., 762, 766
Jaskunas, S. R., 438, 440, 443, 445
Jaureguiberry, G., 688
Javaherian, K., 449, 452, 453
Jayaraman, K., 424
Jeanrenaud, B., 159, 160, 166, 168
Jeckel, R., 709
Jefferson, L. S., 150, 151, 161, 251, 288, 289, 291
Jeffery, B. A., 35, 36, 44, 363
Jeger, O., 683, 685
Jencks, W. P., 360, 367, 371, 373, 375, 376, 381, 702
Jeng, D. Y., 338, 339
Jenkins, M. B., 86
Jenkins, W., 155
Jenkins, W. T., 372, 384
Jenkinson, D. H., 158
Jensen, E. F., 373
Jensen, L. H., 334, 337
Jensen, R. A., 97, 98, 99, 100
Jerussi, R., 671
Jiang, N., 210
Jobsis, F., 282
Joel, C. D., 160
Johansen, J. T., 701, 710
John, E. A., 573
Johns, P. T., 295
Johnson, A. R., 324
Johnson, A. W., 238
Johnson, C. K., 447
Johnson, F. H., 598, 600, 601, 602, 603, 619, 621, 622, 623
Johnson, G. L., 335, 353
Johnson, L. N., 26, 37, 38, 40, 41, 43, 44, 45, 46, 363, 365, 366, 373, 376, 377, 382, 383, 515
Johnson, M. C., 504, 507
Johnson, P., 318, 528, 533
Johnson, R. A., 220
Johnson, W. S., 677, 685
Johnston, J. B., 268
Johnston, J. M., 304
Johnstone, R. M., 205
Joiner, P. D., 158, 168
Jolles, J., 363
Jolles, P., 363
Jones, E. A., 281
Jones, G. E., 307
Jones, J. B., 669
Jones, J. M., 532, 533
Jones, K. M., 279
Jones, K. W., 645
Jones, M. E., 203
Jones, R. G. W., 93
Jones, R. T., 746, 750, 752, 754, 773, 774, 780
Joo, C. N., 318, 467
Jordan, D. C., 332
Jordan, E., 414, 419, 420, 426, 427, 428
Jortner, J., 577, 579
Josef, D., 334
Joseph, P. K., 287, 288
Josse, J., 193
Joyner, A., 413, 425, 430
Juarez, H., 564
Jukes, T. H., 133, 731, 757, 772, 773, 775, 776
Julien, J., 110, 111, 119, 137
Junek, H., 711, 712
Jungas, R. L., 150, 158, 159, 169
Jungermann, K., 92
Jureziz, R., 512
Jurtshuk, P., 470, 471

K

Kaback, H., 465
Kabat, E. A., 451, 454, 455, 500, 503, 505, 506, 508, 759, 761, 767, 769
Kabat, S., 111
Kadis, B., 676
Kadota, H., 56
Kaempfer, R. O. R., 430
Kafatos, F. C., 603
Kagamiyama, H., 266
Kagawa, Y., 469, 476
Kahn, A. V., 716
Kai, M., 313
Kaiser, A. D., 183, 193, 194, 419, 420
Kaji, A., 109
Kaji, H., 109
Kakar, S. N., 95
Kakiuchi, S., 149, 150, 152, 156
Kalckar, H. M., 414, 419, 420
Kalikhevich, V. N., 447
Kalman, S. M., 202
Kamen, M. D., 776
Kameyama, T., 718
Kamimura, M., 164
Kanaoka, Y., 718
Kanazawa, M., 699
Kanazawa, T., 534, 535
Kane, R. E., 539
Kaneko, I., 63
Kaneshiro, T., 308, 309, 466
Kang, A. H., 550, 551, 552, 555, 556, 564, 566
Kang, J. W., 335, 353
Kang, S., 415
Kankare, P., 310
Kannan, K. K., 26, 34, 39, 41, 43, 363, 448
Kao, C. M., 666
Kaplan, A. S., 479
Kaplan, B. H., 232
Kaplan, H. S., 177
Kaplan, M. E., 500
Kaplan, M. M., 88, 90
Kaplan, N. M., 150, 151, 168
Kaplan, N. O., 278
Kaplan, S., 776
Kappas, A., 652, 654
Karabatsos, G., 230
Karaboyas, G. C., 150, 151, 162
Karam, J. H., 166
Karau, W., 144
Karibian, D., 216, 531
Karita, K., 754
Karkhanis, Y. D., 707
Karnofsky, D. A., 210, 211
Karnovsky, M. L., 316, 317
Karpatkin, S., 275, 292, 293
Kartha, G., 26, 31, 39, 40, 41, 363, 366, 448, 509, 515
Karush, F., 500, 504, 505, 515, 761, 768
Kasai, M., 529
Kasha, M., 573, 599, 625
Kasper, C. B., 35, 772, 779
Kassell, B., 702, 703, 713, 715
Kasuya, M., 703
Katagiri, M., 626
Katchalski, E., 447, 645, 654

Kates, M., 306, 308, 318, 466, 467
Kato, T., 233, 234, 469
Katsoyannis, P. G., 777
Katsuki, H., 687
Katterman, R., 290
Katz, A., 418
Katz, A. M., 527
Katz, E. P., 556
Katz, E. R., 143, 776
Katz, J., 263
Katz, J. L., 577, 579
Katz, S., 111
Katze, J., 413
Kauffman, D. L., 28, 372, 779
Kaufman, B., 319
Kautsky, H., 626
Kauzmann, W. J., 455, 456
Kaverzneva, E. D., 706
Kawahara, F. S., 668, 671
Kawamura, H., 539
Kawata, T., 70
Kay, C. M., 526, 531, 532, 534
Kayne, F. J., 382
Kazarinova, L., 136, 145
Ke, B., 474
Kearns, D. R., 625, 716
Kedes, L. H., 648
Keech, D. B., 266, 267, 268, 271, 272, 274, 279, 290
Keefer, R. M., 697
Keeley, F., 563
Kefalides, N. A., 556
Keil, B., 28, 717, 779
Keilin, D., 59, 64, 736
Kellenberger, E., 465
Kellerman, M., 26, 27, 30, 40, 41, 367
Kellermeyer, R. W., 227
Kelley, H., 718
Kelley, W. N., 211, 212
Kelley, W. S., 109
Kellogg, D. A., 145, 776
Kellogg, R. E., 577
Kelly, D. M., 45
Kelly, M., 333, 334, 335, 338, 341, 348, 349, 350
Kelus, A. S., 501, 504, 505
Kemp, P., 314
Kemp, R. G., 151, 153, 155, 158, 167, 168
Kendrew, J. C., 26, 37, 38, 39, 40, 41, 42, 43, 363, 386, 746, 747, 750, 754
Kenkare, U. W., 366
Kennan, A. L., 561
Kennedy, E. P., 306, 309, 311, 313, 314, 479
Kennedy, I. R., 341, 346
Kennedy, R., 320
Kenyon, C., 319
Kepes, A., 414, 428, 429
Keresztes-Nagy, S., 699, 772
Kerjan, P., 59
Kern, M., 145
Kerridge, D., 522
Kerwar, S. S., 236, 237, 239, 240, 241
Kessler, D. P., 418, 419, 427
Ketterer, H., 166, 168
Keyl, H. G., 640
Kezdy, F. J., 46, 360, 367, 371, 373
Khairallah, E. A., 151
Khan, A. U., 599, 625
Khidekel, M. L., 335, 353
Khoo, M. K. Y., 205
Khorana, H. G., 131, 132
Kida, S., 423
Kiefer, B., 539
Kielley, R. K., 220
Kielley, W. W., 528, 529, 530, 708
Kiho, Y., 425
Kikuchi, G., 754
Kilmartin, J. V., 750, 757, 780, 781
Kilpatrick, R., 163
Kimball, R. W., 716
Kimmel, J. R., 779
Kimura, A., 510
Kimura, J., 515
Kimura, M., 530
Kimura, T., 673, 674, 679
King, H., 332
King, R. C., 774
King, T. J., 639
King, T. P., 712
King, W. L., 59, 64
Kingdon, H. S., 81, 82, 391, 392, 397
Kinoshita, N., 535
Kinsky, S. C., 485
Kipnis, D. M., 158, 161, 164, 166
Kiritani, K., 94, 95
Kirk, D. L., 645, 653, 730
Kirkwood, S., 455, 456
Kirsch, J., 371
Kirschbaum, J. B., 413
Kirschner, K., 386, 389, 394
Kirtley, M. E., 395, 396, 399, 718
Kiselev, N. A., 113
Kishi, Y., 600, 601, 605
Kishimoto, H., 600, 601
Kisliuk, R. L., 236, 240, 241
Kitagawa, M., 510
Kitagawa, S., 533
Kitazume, S., 335, 353
Kittredge, J. S., 318
Kiyasu, J. Y., 311, 314
Klainer, L. M., 152, 155, 158
Klee, W. A., 702
Kleihauer, E., 754, 773, 774
Klein, N. W., 218
Kleinwächter, V., 587
Klenow, H., 210, 211
Kleopina, G. V., 706
Kleppe, K., 715
Klingsberg, A., 682
Klinman, N. R., 504, 505, 515
Klotz, I. M., 699, 717, 718
Klotz, L. C., 144
Klouwen, H., 470, 474, 475
Klucas, R. V., 346
Klug, A., 36, 113, 524, 536
Kluh, I., 779
Kneer, P., 290
Knight, E., Jr., 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353
Knight, K. L., 503
Knivett, V. A., 324
Knoth, W. H., 335, 353
Knowles, P. F., 98
Knox, G., 377
Knox, W. E., 269
Ko, A., 709
Kobayashi, M., 337
Kobayashi, S., 535, 676
Kobayashi, Y., 62, 63, 64
Koch, B., 333, 334, 335, 337, 338, 341, 343, 344, 345, 346, 348
Koch, J. P., 421
Kochert, M., 714
Koch-Weser, J., 157
Kodama, A., 526, 527
Koegel, R. J., 648
Koenig, D. F., 26, 36, 39, 363, 365, 373, 376, 377, 382
Koeppe, R. E., 272
Koestler, A., 2
Koffler, H., 521, 522
Kogan, L. M., 676
Kohen, C., 155
Kohen, E., 155
Kohl, D. M., 644
Kohler, H., 534, 750
Kohn, K. W., 181
Kohn, L., 267, 287, 291
Kohn, R., 158
Köhne, C., 703
Koizumi, K., 535
Kolb, J., 464
Kollín, V., 428, 430
Kominek, L. A., 60
Kominz, D. R., 526, 527,

528, 531
Kondo, M., 54, 56, 60, 70
Konigsberg, I. R., 547
Konigsberg, W., 498, 499, 517, 708, 750, 767, 781
Konijn, T. M., 169
Kono, M., 110, 115, 117, 119, 120
Konrad, M. W., 413
Kools, J. W., 59, 61
Kopka, M. L., 26, 34, 39, 363, 448, 745
Koren, B. J., 257
Koritz, S. B., 150, 151, 162, 163, 670
Korn, E. D., 454
Kornberg, A., 51-78; 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 66, 67, 68, 69, 70, 71, 72, 73, 176, 191, 192, 193, 195, 212
Kornberg, H. L., 265
Kornfeld, R., 271
Kornfeld, S., 271
Korngold, L., 504
Korotkina, O. Z., 447
Koshland, D. E., Jr., 359-410; 39, 41, 360, 365, 370, 371, 372, 373, 375, 377, 380, 381, 382, 389, 395, 396, 397, 398, 399, 707, 708, 715, 717, 718
Koshland, M. E., 501, 506, 711, 712, 759
Kosicki, G. W., 273
Kostka, V., 779
Kotaki, A., 705, 713
Kouba, R. F., 526
Kovach, J. S., 428, 645
Kowal, J., 705
Kozub, G. I., 335, 353
Kozuro, M., 759, 767
Kraemer, K., 643
Kramer, F. R., 645
Krans, H. M. J., 528
Krantz, S. B., 654
Krask, B. J., 59
Kraus, A. P., 752, 753
Kraus, G., 159
Kraus, L. M., 752, 753
Krause, R. M., 512
Krauss, P., 334
Kraut, J., 26, 27, 30, 40, 41, 367
Kravchenko, N. A., 706
Krebs, E. G., 151, 155, 156, 157, 158, 168, 274, 392
Krebs, H. A., 215, 252, 254, 255, 257, 259, 260, 266, 267, 268, 269, 271, 272, 276, 277, 280, 283, 284, 286, 288, 289, 290, 291, 295, 296
Kreevoy, M. M., 379
Kreig, D. R., 176
Kreiger, N., 620
Kreil, G., 737, 738, 745, 772, 776, 779
Kreisberg, R. A., 154, 157, 286
Kreiss, P., 608, 609, 610, 615, 616, 617, 619, 624
Kretsinger, R. H., 647
Krichevskaya, A. A., 649
Krimsky, I., 395
Krishna, G., 150, 154, 158, 159, 160
Krishna Murty, G. G., 58
Kritchevsky, G., 314
Kritzman, J., 513
Krogh, A., 393
Kruger, F. A., 157
Kruse, W., 386
Krutilina, A. I., 131, 132, 136
Kubinski, H., 146
Kubo, S., 532, 535
Kubota, M., 335, 353
Kuby, S. A., 525, 704
Kucera, J., 533
Kuehl, F. A., 150, 154, 160
Kuff, E. L., 648
Kuhn, N. J., 305, 306
Kühne, W., 529
Kukovetz, W. R., 156, 157
Kuksis, A., 309
Kummerow, F. A., 315
Kumosinski, T. F., 446, 447
Kundig, F. D., 319, 478, 479
Kundig, W., 478, 479
Kung, H. K., 131, 132, 135
Kung, T-H., 526
Kunkel, H. G., 501, 502, 513, 759, 760, 767
Kunnes, R. S., 305, 306
Kunst, P., 28
Kuratomi, K., 243, 244
Kurihara, K., 653, 705, 706, 710, 711, 715, 716
Kurland, C. G., 110, 117, 119, 124, 125
Kurogochi, Y., 154, 161
Kurosawa, Y., 677
Kushmerick, M. J., 535, 536
Kushner, D. J., 318, 466, 467
Kuwabara, S., 615, 616, 617, 618, 624
Kwei-ping, S. K., 449, 451
Kwon, T. W., 275
Kycia, J. H., 703, 704

L

LaBella, F., 563
Labie, D., 751, 773, 775
Laborit, H., 158
Labouesse, B., 29, 37, 46, 367, 383, 703
Lacon, C. R., 211
Lacroute, F., 98, 100, 203
Lacy, P. E., 166
Lafferty, M. A., 651
L'Age, M., 267, 268, 279, 285, 286, 287, 288, 291, 296
Lagerkvist, U., 137, 138, 139
Laing, R. R., 703, 707
Laishley, E. J., 66
Lake, J. A., 144
Laki, K., 372, 526, 528, 735
Lamar, C., 651
Lambert, A. E., 166
Lamm, M. E., 505
Lamola, A. A., 574, 575, 579, 581, 583, 588
Lampen, J. O., 485
Lampidis, R., 558
Lanckman, M., 508
Landau, B. R., 263, 267, 277, 286, 287, 290
Landesman, R., 644
Landman, O. E., 479
Landon, M., 35, 772, 779
Lands, W. E. M., 321
Landsteiner, K., 498
Landucci, J. M., 549
Lane, B. G., 110, 111, 125, 137, 138, 139, 142
Lane, M. D., 268
Lanéelle, G., 312
Lanéelle, M-A., 312
Langdon, R. G., 702
Langer, B., 762
Langridge, R., 63
Lanka, E., 143
Lansford, E. M., Jr., 85
Lapthisophon, T., 182
Lardy, H. A., 252, 255, 266, 268, 269, 270, 286, 287, 288, 291
Lark, C. A., 505
Lark, K. G., 480
Larner, J., 151, 161, 162, 167, 250, 261, 271, 274, 288, 289
Larrabee, A. R., 304, 305, 306
Larsen, C. J., 110, 111
Larson, R. E., 536
Larsson, A., 206, 207, 208, 210, 233, 234, 392
Lascelles, J., 92, 93, 307
Lash, J. W., 634
Lasher, R., 634
Laskin, A., 682
Laskowski, M., Jr., 46
Latham, H., 648
Latham, H. G., 707

Laufer, H., 647
Läuger, P., 481, 484
Laurent, T. C., 233
Lauris, V., 271, 294
Laursen, R. A., 604
Lauterbom, W., 279, 235, 296
Law, J. H., 304, 307, 308, 309, 317, 322, 323, 324, 688
Lawley, P. D., 135, 176, 178, 179, 181
Lawrence, N. L., 58, 59
Lawson, W. B., 29, 47
Lax, S. R., 97
Lazzarini, R. A., 63
Lea, M. A., 269, 270, 283, 284, 295
Leadbeater, L., 533
Leahy, J., 413
Leberman, R., 36
Lebovitz, H., 699
Lebovitz, H. E., 166, 167, 498, 499, 726, 760, 767, 768
Leboy, P. S., 112, 113, 124, 125
Le Bras, G., 87, 88, 392
LeComte, J. R., 333, 334, 335, 336, 338, 339, 340, 341, 342, 344, 346, 347, 350
Ledbetter, M. C., 36
Lederberg, E. M., 427
Lederberg, J., 479, 768, 771
Lederer, E., 319, 688, 689
Lederman, M., 418
Lederman, R., 699
Lee, H. A., 228, 229
Lee, J. C., 142, 143
Lee, L. P. K., 273
Lee, L-W., 89
Lee, N., 85, 418, 419
Lee, S. S., 679, 681, 682
Lee, W. H., 56, 58
Lees, H., 334
Le Gal, M-L., 205
Le Gal, Y., 205
Legault-Demare, J., 111
Legrand, M., 445, 450, 451
Lehman, I. R., 176, 192, 194
Lehmann, H., 746, 751, 752, 753, 754, 757, 772, 773, 780
Lehninger, A. L., 486
Lehrer, S. S., 46
Leifson, E., 522
Leigh, G. J., 351
Leigh, H. M., 682
Leighty, E. G., 157
Leikhim, E., 712
Leive, L., 428, 430, 478
Lelong, J. C., 110, 111
Lemieux, R. U., 44, 365
Lempert, K., 713
Lempert-Sréter, M., 713
Lenard, J., 453, 454, 474, 699
Lenfant, M., 688, 689
Leng, M., 586, 587
Lengeler, J., 429
Lennarz, W. J., 304, 311, 312, 315, 319, 322
Lennox, E. S., 498, 499, 502, 759, 762, 768, 771, 772
Lenormant, H., 447
Lent, R., 558, 559
Leonard, N. J., 604
Léonis, J., 700
Lerman, L. S., 589, 590
Lerman, M. I., 114, 116, 118
Leslie, R. B., 584, 585
Lesslauer, W., 481, 484
Lester, G., 422
Letters, R., 308, 312
Leuthardt, F., 704
Lev, A. A., 485
Levenberg, B., 202
Levenbook, L., 528
Levene, C. I., 549, 563, 564
Levere, R. D., 652, 654, 780
Levin, A. P., 206, 216
Levin, Y., 735
Levine, L., 712
Levine, R. A., 157
Levine, S., 672
Levinson, H. S., 56, 59, 61
Levinthal, C., 62, 63, 64, 123, 190
Levinthal, M., 479
Levisohn, S., 72
Levitan, P., 678
Levy, A. L., 700
Levy, H. M., 534, 537
Levy, H. R., 662, 671
Lewandowski, L. J., 121
Lewis, J. P., 751
Lewis, M., 528
Lewis, M. S., 528, 563, 564
Lewis, T. B., 386
Li, C. H., 699, 702, 707, 778
Li, L., 131, 132, 136
Li, L. K., 366
Li, W. Y., 275, 293
Liang, C. R., 318
Libano, W. Y., 716
Liberman, E. A., 486
Lidsky, M. D., 556
Lieberman, I., 210, 211
Lieberman, S., 504, 678
Liebermeister, H., 157
Liener, I. E., 779
Liess, K., 81, 82
Light, A., 717, 779
Lightly, F. S., 321
Liljas, A., 26, 34, 39, 41, 43, 363, 448
Lin, E. C. C., 421, 478
Lin, K., 684
Lindahl, T., 144, 441
Lindblow, C., 46, 448, 449, 451
Linderstrom-Lang, K. V., 388
Lindigeit, R., 124
Lindsay, D. T., 647
Lindsay, J. G., 211
Lindsley, D. L., 641
Lines, J. G., 753
Lingens, F., 98, 99, 100
Linn, S., 176
Linschitz, H., 578, 598, 599, 623
Lipman, L. N., 761
Lipmann, F., 372, 527
Lipmann, R., 261
Lipscomb, W. N., 26, 32, 33, 34, 39, 41, 363, 367, 382
Liquori, A. M., 37, 38
Listowsky, I., 395, 454
Littau, V. C., 647
Little, A. B., 674
Little, J., 47, 366
Little, J. M., 164
Little, J. R., 504, 508, 509, 512, 514
Little, J. W., 194
Littlefield, J. W., 214
Littleton, G. K., 158, 161, 164, 166
Littna, E., 644, 645
Litwack, G., 151, 154
Liu, A. K., 778, 779
Liu, N-C., 526
Liu, T., 779
Ljungdahl, L., 243, 244
Lloyd, J. E., 606
Lloyd, K. O., 455
Lloyd, W., 168
Loach, P. A., 745
Lochmuller, H., 294
Locke, M., 635, 641
Locke, R. H., 529
Lockshin, A., 343, 344, 347, 348
Lodemann, E., 415
Loeb, G. I., 366
Loebel, J. E., 145, 776
Loening, U. E., 648
Loewy, A. G., 538
Löffler, G., 268
London, I. M., 780
Long, C., 323
Longley, W., 526
Longsworth, J. W., 574, 575, 582, 586, 587

Loomis, W. F., Jr., 429, 646
Lopez, M. A., 503
Lorand, L., 152, 169, 735
Lord, K. E., 684
Lorence, J. H., 98, 100, 393
Lorenson, M. Y., 214, 219
Lorkin, P. A., 751, 753
Losada, M., 279, 333
Losert, W., 153
Lotfield, R. B., 384
Lou, M. F., 203
Loutit, J. S., 96
Love, D. S., 274, 529, 530
Love, W. C., 306
Lovenberg, W., 334
Lovins, R. W., 516
Loviny, T., 85
Low, B., 184, 186
Low, R. B., 648, 653
Lowe, G., 372
Lowe, P. A., 304
Lowe, R. D., 160
Lowenstein, J. M., 214, 215, 216, 304
Lowey, S., 507, 526, 530, 531, 532, 533, 534, 538
Lowry, O. H., 167, 168, 253, 259, 263, 271, 277, 279, 280, 281, 282, 283
Lowy, J., 522, 524, 528, 536, 537, 539
Lu, Z-X., 526
Lubimova, M. N., 523, 525
Lubin, M., 119, 123
Lübke, K., 730
Lucas, Z. J., 214
Luck, S. M., 531, 532, 533, 534
Lucy, J. A., 477
Ludwig, M. L., 26, 32, 33, 34, 39, 41, 363, 367, 382, 702, 703
Luisada-Opper, A. V., 711
Lukanidin, E. M., 649
Lukton, A., 275, 371, 393
Lumry, R., 375
Lund, P., 268, 276, 277, 288
Lundgren, D. G., 56, 60
Lundholm, L., 155
Lundin, J., 26, 34, 39, 41, 43, 363
Luppis, B., 704
Luria, S. E., 183, 187, 425, 428
Lust, G., 308
Lustgarten, J., 739
Luyckx, A., 166
Lygre, D. G., 294, 295
Lyman, K., 203
Lyman, R. L., 309
Lynen, F., 227, 281, 305, 306, 393
Lynn, W. S., 679, 680
Lyon, J. B., 168, 274

M

Maaløe, O., 119
Maas, G., 386
Maas, R., 424
Maas, W. K., 412, 413, 421, 424
McBride, O. W., 556
McCall, M. S., 288
McCalla, K., 750
McCaman, R. E., 309
McCann, M., 443
McCapra, F., 604
McCarthy, B. J., 115, 124, 644, 650
McCarthy, J., 513
McCloskey, J. A., 324, 688
McClure, D. S., 578
McCollister, R. J., 205
McConkey, E. H., 117, 120
McConn, J. D., 72
McConnell, H. M., 46, 394, 718
McCormick, N. G., 61
McCoubrey, A., 703
McCoy, J., 415
McCubbin, W. D., 526, 532, 534
McDaniel, E. G., 306
McDaniel, M., 750, 751
McDonald, C. C., 337
Macdonald, I., 304
MacDonald, R., 121
MacDougall, J. C., 312
McDowell, M. A., 736, 737
Macduff, G., 394, 400, 754
McElroy, W. D., 385, 598, 600, 601, 604, 605, 606, 607, 608, 610, 612, 614, 622, 624, 708
McEwan, M., 704
McFall, E., 413, 421
MacFarlane, A. S., 711, 712
MacFarlane, M. G., 466
McGeachin, R. L., 702, 704
McGrath, R., 177, 183, 188
Machida, M., 718
McIlreavy, D. J., 110, 124, 125, 126, 142
McIntire, K. R., 762
McIntosh, R., 753
MacKay, I. R., 513
McKenzie, H. A., 708
Mackie, I. M., 530
McKinley-McKee, J. S., 666
McKinney, J. A., 314
McKinney, L. L., 709
McKnight, S. D., 564
McLain, P. L., 156, 157
McLaren, A. D., 176
MacLaren, J. A., 717
McLaughlin, C. S., 137, 138
MacLennan, D. H., 471
McMurray, W. C., 315
McNary, J. E., 333, 334, 344
McPhie, P., 443
McQuillen, K., 464
MacRae, T. P., 447
Maddy, A. H., 465, 470, 474
Madison, J. T., 131-48; 131, 132, 135, 136, 146
Madison, L. L., 288
Maeba, P., 94
Maeda, H., 447
Maestre, M. F., 444
Magasanik, B., 119, 123, 205, 206, 216, 391, 421, 423, 427, 429, 430
Magee, P. T., 94, 95
Mager, J., 216
Maggio, R., 643, 645, 729
Mahl, M. C., 333, 334
Mahler, H. R., 360, 367
Mahler, I., 192
Mahler, R., 257, 288
Mahowald, T. A., 704
Main, P., 35, 36, 363
Mair, G. A., 26, 37, 38, 39, 40, 41, 43, 44, 46, 363, 365, 373, 376, 377, 382
Maita, T., 750
Maitra, U., 144
Majerus, R. W., 304, 305
Majima, H., 257
Makela, O., 505
Makinose, M., 527
Makman, M. H., 154
Makman, R. S., 153
Malamud, D., 165
Malamy, M. H., 427, 428, 777
Malcolm, B. R., 474
Maley, F., 214, 216, 217, 219
Malhotra, S. K., 668
Malins, D. C., 317
Malkin, L. I., 643, 645, 646
Malkin, R., 334, 337
Mallet, L., 623, 625
Mallett, G. E., 521, 522
Malmström, B. G., 702
Malnic, G., 615
Mamet-Bratley, M. D., 508
Mandel, L. R., 150, 154, 160
Mandel, M., 56
Mandeles, S., 143

Mandelstam, J., 67, 68, 71, 72, 73, 429
Manely, K., 187
Mangan, J., 640
Mangiarotti, G., 116, 118
Mangold, H. K., 314
Mangum, J. H., 236, 237, 239, 240, 241
Manjeshwar, R., 271, 293, 294
Mann, T., 525
Manner, G., 647
Mannik, M., 501, 502, 759
Manning, M., 510
Mano, Y., 649
Manor, H., 121, 124
Mansour, T. E., 150, 151, 155, 164, 167, 253, 293
Marai, L., 309
Marcaud, L., 650
Marchalonis, J., 768
Marchesi, V. T., 539
Marchiori, F., 708
Marcker, K. A., 776
Marcot-Queiroz, J., 111, 114
Marcus, A. J., 304
Marcus, P. I., 662, 671
Marechal, J., 322
Marfey, P. S., 47, 366
Margoliash, E., 727-90; 26, 34, 35, 39, 363, 448, 635, 701, 729, 731, 732, 733, 734, 735, 736, 737, 738, 739, 741, 742, 743, 744, 745, 755, 772, 773, 774, 776, 777, 779, 780
Margolin, P., 101, 105, 423, 424, 425
Margolis, S., 702
Margulies, A. D., 183
Marinetti, G. V., 309, 312, 319, 322, 466, 467
Mark, F. G., 28
Markert, C. L., 637
Markland, F. S., 35, 772, 779
Markovich, D. S., 395
Markovitz, A., 415, 416
Marks, P. A., 645
Marks, V., 166
Markus, G., 717, 761, 762
Marmur, J., 111, 122, 124, 413
Marone, R., 192
Marquisee, M. J., 119, 131, 132, 133
Marr, A. G., 55, 58, 59, 61, 466
Marré, E., 645
Marri, G., 166
Marsh, J. M., 150, 151, 163
Marsh, M., 607
Marsh, R. E., 39
Marsh, S., 672
Marti, E., 481, 484
Martin, C. J., 707
Martin, G. R., 551, 552, 553, 556, 558, 559, 563, 564, 565, 566, 567
Martin, J. K., 136
Martin, R. G., 425, 426, 427, 428, 777
Martinez, G., 372
Martinez, R. J., 522
Martonosi, A., 525, 529, 534
Maruo, B., 60, 476
Marushige, K., 646, 647, 648
Maruyama, H., 268
Maruyama, K., 524, 526, 527, 528, 537
Marzloff, W. F., 351
Marzotto, A., 700
Masaki, T., 527, 537
Mason, H. S., 672, 673, 675
Mason, M., 372
Massa, J., 610, 611, 612, 615, 616, 624
Massey, V., 703, 704
Massy-Westropp, R. A., 683, 684, 685
Masui, T., 679
Matches, J. R., 55
Mathews, F. S., 36, 41
Mathias, A. P., 697
Matkovics, B., 676
Matoon, J. R., 736, 739
Matrone, G., 565
Matschinsky, F. M., 156
Matsubara, H., 382, 706, 734, 736, 737, 772, 779
Matsuda, G., 750
Matsuhashi, M., 472
Matsukura, S., 163, 168
Matsuo, A., 705, 750
Matsuo, K., 599
Matsushima, A., 706, 710, 714, 715
Matsushiro, A., 105, 423, 425, 428
Matsushita, S., 335, 353
Matsuyama, H., 163, 168
Mattern, I., 180, 181
Matthews, B. W., 26, 27, 29, 37, 39, 40, 43, 44, 363, 367, 448
Matz, L., 55
Mauer, P. H., 699
May, C. S., 372
Mayed, H. S., 391
Mayer, S. E., 156, 157, 162, 167
Mayers, G. L., 325
Mayfield, E. D., Jr., 203
Mayo, E., 779
Mayr, E., 778
Mazia, D., 539, 634, 640, 645
Mazumder, R., 227
Mazzarella, L., 26, 42, 382, 746, 747, 754
Mead, C. G., 193
Mead, J. F., 316, 317
Means, G. E., 714
Mecca, C. E., 558, 565, 567
Mecke, D., 80, 81, 82
Mednieks, M., 453, 454, 474
Meeks, R. C., 672
Mehendale, H. M., 310
Mehler, A., 381
Meinwald, J., 603
Meisler, J., 152, 169
Meister, A., 202, 203
Meister, P. D., 672, 682
Melamed, M. D., 449, 451
Melchers, F., 144, 502
Mellors, R. C., 504, 513, 514
Meloche, H. P., Jr., 372
Melon, L., 158
Meloun, B., 779
Mendelsohn, L., 163
Mendicino, J., 151, 168, 252, 265
Meng, H. C., 155, 158, 168
Menon, T., 149, 152
Mentendiek, M. E., 251, 252, 259, 269, 291, 295
Menzel, D. B., 529
Mercer, E. H., 467
Mergeay, M., 203
Mergenhagen, S. E., 465
Merigan, T. C., 701
Meriwether, B. P., 372, 395
Merlevede, W., 155
Merola, A. J., 470, 471
Merril, C. R., 136
Merrill, S. H., 131, 132, 136, 146
Merriwether, L. S., 351
Merz, H., 708
Meselson, M., 114, 125, 176, 190
Metzenberg, R. L., 176
Metzger, H., 499, 514, 515, 768
Meuris, P., 98, 100
Meyer, H., 324
Meyer, W. L., 274
Meyers, C. D., 682
Michaelis, G., 420, 428
Michel, J. F., 60, 72
Michel, M., 501
Michell, R. H., 313
Michelson, A. M., 56, 57, 441, 581, 586, 587
Middlebrook, W. R., 531, 735
Midgley, J. E. M., 110, 111,

115, 124, 125, 126, 142
Mihalyi, E., 533, 534
Mii, S., 534
Mikeš, O., 779
Mikoryak, C. A., 704
Miksche, U., 164
Milch, P., 319
Mildvan, A. S., 371, 382
Miles, D. W., 441
Miljanich, P., 309
Millar, D. B., 133, 144
Miller, D. S., 192
Miller, E. J., 512, 556, 558, 559, 563, 565, 567
Miller, J. H., 413, 416, 417
Miller, L. L., 286, 288
Miller, N., 489
Miller, O. L., 640
Miller, R. S., 268
Millet, J., 59, 60, 66, 75
Millikan, G., 602
Millman, B. M., 536, 537
Millonig, G., 640
Milstein, C., 498, 499, 500, 501, 759, 761, 762, 766, 767, 768, 769, 771, 772
Minari, O., 320
Minato, S., 714
Mintz, B., 643, 651
Mirsky, A. E., 636, 643, 645, 647, 648
Mirzabekov, A. D., 131, 132, 136, 145
Mishima, S., 425
Misono, A., 335, 353
Mitchell, C. D., 470
Mitchell, E. R., 531
Mitin, Yu. V., 447
Mitra, S., 191, 193
Mitruka, B. M., 59
Mitsui, H., 115, 118
Mittal, J. P., 574, 588
Miura, K., 110, 111, 120, 121, 145
Miyagi, M., 644, 646
Miyaji, T., 752, 753, 754
Miyake, T., 163, 168, 709
Miyazawa, Y., 535
Mizkat, H. J., 288
Mizuno, D., 424
Mizuno, M., 709
Moberly, B. J., 56, 70
Moffat, B., 778
Mohme-Lundholm, E., 155, 158, 168
Mohri, H., 523, 524, 525
Molinaro, M., 135, 136, 137
Möller, W., 112
Molnar, J., 649
Molotkovsky, J. G., 312
Mommaerts, W. F. H. M., 152, 441, 528, 529, 534, 535
Momose, H., 206, 216
Mondon, C. E., 161, 163
Monier, R., 110, 111, 114, 119, 137
Monk, M., 189
Monod, J., 98, 269, 361, 362, 390, 396, 397, 412, 413, 414, 415, 416, 417, 424, 425, 427, 429, 632, 655
Monro, R. E., 68, 71, 72
Monroe, D., 552, 556
Monroy, A., 641, 645, 729
Montgomery, J. A., 211
Moore, C., 282
Moore, E. C., 210, 233
Moore, P. B., 112
Moore, S., 31, 33, 36, 365, 701, 706, 708, 715, 779
Moos, C., 533, 534
Morales, M., 530, 532
Morávek, L., 779
Morell, H., 98, 111
Morey, K. S., 535
Morgan, H. E., 156, 157, 162, 164, 273, 280
Morgan, R. W., 638
Morgan, T. E., 467, 470
Mori, R., 253, 269, 271, 283, 296
Morikawa, N., 425
Morimura, H., 253, 269, 271, 279, 283, 285, 296
Morino, Y., 266, 372
Morita, F., 534
Morita, Y., 163
Morley, C. G. D., 233
Morningstar, J. F., Jr., 236, 240
Morowitz, H. J., 63, 476
Morris, C. J. O. R., 715
Morris, J. A., 338, 339
Morris, N. R., 211
Morris, S. J., 31
Morrison, J. F., 201
Morse, M. L., 479
Morse, P. A., Jr., 211
Morse, S. L., 751
Mortenson, L. E., 332, 334, 335, 336, 338, 339, 340, 341, 342, 343, 344, 345, 351
Mortimer, R. K., 88
Mortimore, G. E., 251, 286, 288
Morton, I. K. M., 158
Moscona, A. A., 547, 635, 645, 646, 653, 730
Moser, C., 646
Mosimann, J. E., 136
Moss, D. W., 666
Moss, G. P., 683, 687
Mosse, H., 214
Motokawa, Y., 754
Motulsky, A. G., 776
Mourkides, G. A., 272
Mower, H. F., 332, 334, 339, 342, 344, 772, 775
Moyer, W. A., 646
Mozen, M. M., 347
Mozes, E., 505
Mross, G. A., 735, 744, 777, 779, 780
Mueller, H., 526, 527, 530, 531, 532, 533
Mueller, P., 480, 481, 482, 483, 485, 486, 489
Muhlbachova, E., 158
Muir, R. D., 680
Muirhead, H., 26, 33, 39, 40, 42, 44, 363, 367, 382, 386, 394, 452, 746, 747
Muller, C. J., 773, 775
Müller, G., 238, 240
Müller, O., 225, 238, 240
Müller-Hill, B., 414, 415, 416, 424, 429, 430
Munch-Petersen, A., 207, 211
Munkres, K. D., 468, 469
Munro, A. J., 140
Munro, D. S., 168
Munske, K., 154
Munson, P. L., 715
Munson, T. O., 334, 340, 342, 344, 345, 346, 350, 351
Murachi, T., 383, 706, 709
Murad, F., 150
Murakami, K., 673
Murakami, S., 524
Murase, Y., 714
Murayama, M., 753
Murdock, A. C., 44
Murdock, A. L., 704
Murphey, W. H., 278
Murphy, A. J., 35, 745
Murphy, M. L., 211
Murray, A. W., 211, 212
Murray, H. C., 672, 677, 682
Murray, J., 136
Murray, N. E., 427
Murray, R. G. E., 465
Murrell, J. N., 578, 579
Murrell, W. G., 52, 53, 55, 56, 68, 72
Mussell, S., 557
Muto, A., 111, 123, 124
Myer, Y. P., 35, 745
Myers, D. V., 448
Mysels, K. J., 481

N

Nadeau, R., 685
Nagai, J., 319
Nagai, S., 89
Nagai, Y., 550, 551
Nagamatsu, A., 708
Nagano, H., 649

Nagel, R. L., 752, 753, 772
Nagler, C., 191
Nags, E. H., 63
Nahas, G. G., 158, 161, 168
Naidu, M. S. R., 564
Nair, K. G., 153
Najjar, V. A., 372, 373
Nakada, D., 119, 120, 123, 124, 427
Nakagawa, H., 119
Nakahara, T., 64
Nakajima, H., 539
Nakamura, A., 533
Nakamura, H., 220
Nakamura, Y., 674
Nakanishi, K., 714
Nakano, E., 529
Nakano, H., 679, 680
Nakase, Y., 647
Nakashima, T., 334, 737, 772, 775
Nakata, A., 427, 429
Nakata, H. M., 68
Nakata, T., 335, 353
Nakaya, K., 713, 714
Nakayama, H., 192
Namm, D. H., 156
Nance, W. E., 775
Nanninga, L. B., 534, 535
Naono, S., 425, 426
Narasimhulu, S., 672, 673, 675
Narise, S., 94, 95
Narita, K., 705, 734, 737, 776
Nasmyth, P. A., 158
Nass, M. K., 465
Nasser, D. S., 99, 393
Natarajan, P., 287, 288
Naughton, M. A., 372, 750, 751, 753, 758, 780
Nayler, W. G., 157
Neal, G. E., 219
Nealson, K., 614, 624
Nechtman, C. M., 751, 754
Needleman, S. B., 736, 737, 779
Neelon, F. A., 135, 136, 137
Neely, J. R., 157
Neet, K. E., 359-410; 375, 382
Neidhardt, F. C., 119, 425
Neilands, J. B., 210
Nelson, C., 503
Nelson, D. J., 219
Nelson, D. L., 51-78; 56, 57, 58, 59
Nelson, J. A., 144
Nelson, L., 523, 525
Nemer, M., 637, 641, 643, 645, 650, 651
Nemethy, G., 37, 38, 396, 397, 399
Nes, W. R., 684
Nesbitt, J. A., 311
Nester, E. W., 97, 98, 99, 100, 393
Netschey, A., 476
Netter, K. F., 281
Neu, H., 478
Neufeld, E. F., 271
Neuhard, J., 207
Neumann, N. P., 715
Neurath, H., 27, 367, 372, 728, 774, 777, 779, 780
Neuwirth, R., 625
Newburgh, R. W., 310
Newcomb, H. R., 59, 62
Newsholme, E. A., 254, 255, 257, 260, 268, 269, 271, 276, 279, 280, 283, 284, 288, 290, 292
Newton, A., 426
Newton, J., 144, 190, 413, 729, 773
Newton, W. A., 426, 427
Ney, R. L., 150, 151, 154, 62
Neyfakh, A. A., 645
Niall, H. D., 762, 769, 778
Nichol, L. W., 400
Nicholas, D. J. D., 332, 333, 334, 337
Nichols, B. W., 307, 308, 310, 319, 324
Nichols, E., 754
Nichols, J. L., 110, 111, 125, 142
Nicol, J. A., 609
Niedergerke, R., 536
Nieman, G. C., 577
Niemann, C., 373
Nierlich, D. P., 205, 206, 216
Nihei, T., 531
Nijkamp, H. J. J., 427
Nikkilä, E. A., 310
Nilsson, R., 637
Nimeck, M. W., 333
Nimni, M. E., 565, 566
Ning, C., 94
Nirenberg, M. W., 776
Nishihara, M., 219
Nishiitsutsuji-Uwo, J. M., 254, 257, 260, 286
Nishikawa, H., 206, 216
Nishimura, S., 135, 145
Nishimura, T., 425
Nishiue, T., 154, 161
Nisonoff, A., 501, 512, 517, 759, 761, 762
Nixon, P. F., 208
Nobbs, C. L., 40, 41, 42, 746
Noce, P. S., 266, 268, 271
Noda, L., 525
Noelken, M. E., 503
Nofre, C., 676
Noguchi, H., 522
Nolan, C., 727-90; 737, 745, 776, 779
Noller, H., 112
Noltmann, E. A., 704
Nomura, A., 216
Nomura, M., 109, 114, 117, 118, 119, 125
Nonomura, Y., 527, 528, 537
Nord, F. F., 699
Nordlie, R. C., 261, 266, 268, 270, 292, 294, 295
Norland, K., 578
Norris, E., 713, 714
Norris, J. R., 62
North, A. C. T., 26, 37, 38, 39, 40, 41, 43, 44, 46, 363, 365, 373, 376, 377, 382
North, J. C., 673, 675
Northrop, G., 156
Norton, W. T., 314, 320, 487
Norwoswalt, E. F., 44
Nossal, G. J. V., 759
Nossal, N. G., 478
Notton, B. M., 266, 286
Novack, B., 672
Novelli, G. D., 135, 145
Novick, A., 415, 416, 424, 425
Novick, R. P., 420
Novotny, C. P., 419
Nowell, J. F., 373
Nowicki, L., 709
Nozaki, M., 333
Nuenke, B. J., 711
Nussenzweig, V., 500, 505
Nutter, L. J., 309, 321
Nyburg, S. C., 335, 353
Nyc, J. F., 308, 309
Nygaard, A. P., 413
Nyman, P. O., 702

O

O'Brien, P. J., 271
Ochoa, S., 227
O'Connor, R. J., 59
Oda, G., 558
Oda, T., 476, 477
Odavić, R., 323
O'Dell, B. L., 565
Oellerman, R., 419
Ogawa, H., 177
Ogawa, S., 394
Ogryzlo, E. A., 599, 625
Ohba, Y., 754
Ohly, B., 267, 286, 287, 288, 291
Ohnishi, S., 46
Ohnishi, T., 539, 705
Ohno, H., 674, 679

Ohsima, Y., 415
Ohtsuki, I., 527, 537
Ohye, D. F., 72
Oikawa, K., 532, 534
Oikawa, T. G., 228
Oishi, A., 122, 124
Oishi, M., 56, 60, 122, 124
Okabayashi, T., 169
Okada, Y., 144, 190, 3, 729, 773
Okamoto, T., 109
Okazaki, R., 191, 212
Okubo, S., 192
Okunuki, K., 382, 702, 705, 706, 736, 739, 745
Okuyama, T., 705
Olander, J., 526
Olcott, H. S., 275, 529, 535, 697, 712
O'Leary, M. E., 178
Oleinick, N. L., 670
Olen, S. S., 683
Oliver, I. T., 259, 261, 293, 294
Oliver, R. M., 393
Olivera, B. N., 194
Olmsted, M. R., 279
Olson, J. M., 36
Olson, M. S., 273, 276, 277, 289, 290
Omata, S., 678
Omote, Y., 716
Omura, T., 672, 673, 674, 675, 676
Onishi, H., 466, 467
Ontjes, D. A., 36, 715
Oosawa, F., 521, 529, 539
Oosterbaan, R. A., 28
Oparin, A. I., 736
Op den Kamp, J. A. F., 312
Opie, L. H., 255, 257, 280
Oppenheim, A. B., 190
Oppenheimer, H., 529, 530
Oppenheimer, H. L., 29, 37, 46, 367, 383, 703
Oppenheimer, J. M., 634
Ordal, Z., 57, 58
Orell, S. A., 275
Orengo, A., 214
Orgel, L. E., 176, 414, 415
Orii, Y., 705
Orloff, J., 149, 150, 151, 158, 163, 164
Orloff, S., 556, 557, 564
Orme-Johnson, W. H., 673
Ormerod, J. G., 343
Ormerod, K. S., 343
Orr, M. D., 208, 233
Orrenius, S., 675
Ortiz de Montellano, P. R., 684, 685
Orton, C., 750, 751, 758, 780
Osawa, S., 109-30; 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 123, 124, 125
Osawa, Y., 677
Osbahr, A. J., 735
Osborn, M. J., 472, 654
Oshinsky, C. K., 194
Oster, G., 716
Osterhout, W. J. V., 480
Osterland, C. K., 512
Osterland, K., 512, 514
Ostwald, R., 309
Osuga, D. T., 705
O'Sullivan, W. J., 381
Ota, H., 750
Otake, E., 112, 113, 114, 117, 118, 120, 123, 124, 125
Otsuji, N., 424
Otsuka, H., 674
Ottesen, M., 701, 710
Oudin, J., 501, 505, 760, 761, 769
Oumi, T., 110, 119, 120
Ourisson, G., 685
Ovary, Z., 505
Overbeek, J. T. G., 481
Overweg, N. I. A., 164
Owsley, D. C., 335, 353
Oxender, D. L., 478
Øye, I., 149, 152, 156, 164
Oyer, D., 653
Oyhe, D. F., 55
Oza, N. B., 707
Ozaki, H., 646
Ozols, J., 705, 779

P

Pace, N. R., 143
Paetkau, V., 266
Pagano, R., 486
Page, J., 714
Page, J. G., 160
Page, L. B., 509, 510
Page, R. C., 564, 565
Page, S., 536, 537
Pajetta, P., 700, 708
Palacian, E., 279
Palade, G. E., 539
Palameta, B., 318, 467
Paléus, S., 745
Paliokas, A. M., 672
Pallansch, M. I., 56
Palmer, G., 337
Palmer, J. L., 517, 762
Palmer, R., 565
Palmer, R. A., 31
Pangborn, M. C., 314
Pannbacker, R., 654
Panos, C., 319, 324
Papaconstantinou, J., 651, 653
Papahadjopoulos, D., 489, 490
Papermaster, B. W., 511, 762, 768
Papirmeister, B., 182
Pappenheimer, A. M., Jr., 510
Pardee, A. B., 118, 189, 390, 391, 414, 415, 430, 478
Park, C-E., 307, 312
Park, C. R., 150, 151, 154, 159, 161, 251, 255, 257, 272, 273, 277, 280, 286, 287, 288, 289, 291, 295
Park, J. H., 372, 395
Park, L., 469
Park, R. B., 477
Park, S. W., 59, 62
Parker, C. W., 504, 507
Parker, D. C., 515
Parker, J., 729, 773
Parker, W. L., 484
Parks, R. E., 156
Parmeggiani, A., 157, 279
Parnas, H., 650
Parry, M. J., 293
Parshall, G. W., 335, 343, 346, 347, 349, 350, 351, 352, 353
Parsons, D. F., 474, 477
Partridge, C. W. H., 393
Partridge, S. M., 558, 559, 561, 562, 563, 565, 567
Parvez, M. A., 687
Pascasio, F., 750, 751, 758, 780
Passonneau, J. V., 167, 168, 253, 259, 263, 271, 277, 279, 280, 281, 282, 283
Pastan, I., 150, 151, 168
Patte, J. C., 85, 86, 87, 88, 89, 98, 392
Pattee, P. A., 95
Pattison, J. R., 92
Paul, E. E., 507
Paul, J., 635, 646
Paul, K-G., 745
Pauling, L., 39, 384, 394, 729, 741, 747, 755, 757, 758, 768, 778, 779, 780
Paulus, H., 311, 313
Pavan, C., 640
Pawalkiewicz, J., 231
Paysant, M., 320
Peacocke, A. R., 182, 589
Pearce, L. E., 96
Pearlman, M., 471
Pearson, J. A., 324
Peck, K., 231
Pecoraro, R., 365
Paigen, K., 118

Pekkarinen, L., 578
Pène, J. J., 650
Peng, C-M., 526
Penman, S., 642, 648, 649, 653
Pennisi, F., 711, 712
Penswick, J. R., 131, 132, 135, 145
Pénzes, P., 676
Pepe, F. A., 526, 538
Pepper, R. E., 59
Peraino, C., 154, 651
Perdue, J. F., 473, 475, 477
Péré, G., 780
Perham, R. N., 498, 762
Perkins, H. R., 312
Perlman, D., 225, 231
Perlmann, G. E., 451, 699, 701
Pernis, B., 502, 504
Perrin, D., 412, 414, 415, 417
Perry, J. J., 68, 71
Perry, M. P., 318
Perry, R. P., 109, 642, 648
Perry, S. V., 521, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 537
Perini, F., 772
Perutz, M. F., 26, 28, 37, 40, 41, 42, 43, 44, 363, 382, 386, 394, 452, 746, 747, 749, 750, 752, 753, 754
Peterkofsky, A., 236
Peterkofsky, B., 645
Peterman, M., 109
Petersen, M. J., 164
Petersen, T. G., 468
Peterson, D. H., 672, 682
Peterson, J. A., 676
Petkau, A., 484
Pettegrew, J. M., 449, 453
Pettijohn, D. E., 182
Pettis, P., 204
Petzold, G. L., 307
Pfeifer, D., 419
Pfennig, N., 56, 57
Pfleger, R. C., 317
Pfleiderer, G., 253, 708, 709
Pflumm, M. N., 449, 450, 451
Pfuderer, P., 615, 616, 617, 624
Philip, G., 704
Phillips, D. C., 26, 37, 38, 39, 41, 43, 44, 45, 363, 365, 373, 376, 377, 382, 448, 454, 515, 746
Phillips, W. D., 334, 337
Philpott, D. E., 533
Phizackerley, P. J. R., 312
Piddington, R., 645, 653
Piérard, A., 202, 203
Pieringer, R. A., 305, 306, 311
Pietruszko, R., 661, 666, 667
Piez, K. A., 547-67; 550, 551, 552, 553, 554, 555, 556, 558, 563, 564, 565, 566, 567
Piggot, P. J., 498, 767
Pikó, L., 640
Pilcher, J. D., 158
Pilkington, T. R. E., 160
Pincus, J., 510
Pine, M. J., 245
Pink, J. R. L., 761, 762, 767
Pinnell, S. R., 559
Pinter, I. J., 680, 682
Pinzino, C. J., 111
Piperno, J. R., 478
Pirog, J. A., 598
Pitot, H. C., 151, 154, 651
Pittard, J., 97, 98, 100, 105
Plackett, P., 319
Plaut, G. W. E., 271
Playfair, J. H. L., 511
Ploeser, J. M., 136
Plummer, T. H., Jr., 709
Pöch, G., 156, 157
Pocker, Y., 372, 380
Pogell, B. M., 275, 279, 284, 285
Pogo, B. G. T., 648
Pogson, C. I., 269, 271, 279, 283, 288, 292
Polacheck, J. W., 324
Poljak, R. J., 36
Polkowski, J., 704
Pollock, J. J., 365
Pollock, M. R., 421
Polonovski, J., 320
Polzella, A., 217
Pontremoli, S., 372, 700, 704, 705
Poole, D. T., 274
Poller, K., 166, 167
Popjak, G., 683
Popkova, G. A., 318, 324
Popp, R. A., 750, 781
Porath, J., 13, 15, 16, 17
Porcellati, G., 310
Porte, D., 166, 167
Porter, G., 578
Porter, J., 168, 274
Porter, J. W., 306
Porter, K. R., 539
Porter, R. R., 498, 499, 502, 503, 517, 759, 760, 761, 762, 767
Portsmouth, D., 372
Posner, J. B., 155, 168
Possmayer, F., 313
Post, R. L., 273
Posternak, Th., 159, 168
Postgate, J. R., 334, 335, 348, 349, 350
Postingl, H., 762
Poston, J. M., 243, 244
Potter, J., 446, 447, 454
Potter, M., 498, 762, 768, 771, 772
Potter, V. R., 204, 211
Potts, J. T., Jr., 39, 703
Poulik, M. D., 505
Pouradier, J., 549
Pousada, M., 307
Powell, J. F., 55, 56, 58, 59, 60, 61
Power, J., 418, 419, 421, 427
Powers, M. J., 556
Poyart, C., 158, 161, 168
Prahl, J. W., 767, 772
Prairie, R. L., 470, 682
Prakash, L., 86
Pratt, J. M., 238, 351
Preiss, J., 250
Prelli, F., 767
Prelog, V., 661, 677
Prescott, D. M., 213, 638, 639, 649
Press, E. M., 498, 499, 503, 761, 767
Pressman, D., 34, 45, 502, 510, 516, 701, 712, 714, 761
Prestidge, L. S., 118, 189, 430, 478
Preston, B. N., 182
Prichard, P. M., 619
Pringle, J. W. S., 521, 538
Prinz, W., 290, 291
Prior, G., 529
Privett, O. S., 309, 321
Prokazova, N. V., 318, 324
Prokop-Schneider, B., 123
Prothero, J. W., 41
Proulx, P. R., 322
Provost, P., 105
Prusik, Z., 28, 779
Pryor, J., 151
Prywansky, K., 506
Ptak, M., 575
Ptashne, M., 188, 430
Ptitsyn, O. B., 447
Pu, L. S., 335, 353
Puck, T. T., 638
Pugh, E. L., 700
Puglisi, L., 158
Pullman, M. E., 372, 373
Purkina, A. V., 447
Putnam, F. W., 498, 499, 501, 697, 759, 761, 762, 763, 764, 766, 767, 769, 771, 772

Putterman, G. J., 729, 773
Putzeys, P., 754
Pye, K., 282
Pysh, E. S., 446

Q

Quattrochi, R., 761, 762
Quiocho, F. A., 26, 32, 33, 34, 41, 44, 45, 46, 363, 385

R

Rabin, B. R., 400, 697
Rabinowitz, J. C., 334, 337
Rabinowitz, M., 152, 169
Racker, E., 281, 372, 395, 469, 470, 476
Radding, C., 187
Radlick, P., 716
Radzimski, G., 502, 516
Raftery, M., 365
Raggio, M., 332
Raggio, N., 332
Rahim, M. A., 680
Rahn, R. O., 574, 575, 582, 586, 587
Raich, W., 675
Raik, E., 751, 753
RajBhandary, U. L., 131, 132
Ralick, P., 625
Rall, T. W., 149, 150, 151, 152, 155, 156, 161, 162, 168
Ramachandran, G. N., 37, 38, 39
Ramachandran, L. K., 698, 716
Ramaiah, A., 283
Ramakrishnan, C., 37
Ramakrishnan, T., 95, 427
Ramaley, R. F., 60, 62
Randle, P. J., 157, 160, 166, 168, 254, 260, 269, 271, 273, 279, 283, 288, 292, 728
Ranney, H. M., 752, 754, 772
Rao, G. A., 304
Rao, S., 271, 293, 294
Raper, C., 155, 156
Raper, J., 476
Rapport, M. M., 314
Raskas, H. J., 114
Rath, C. E., 752, 772
Raval, D. N., 268, 383
Ravel, J. M., 83, 89, 97, 425
Ravilly, A., 40, 45, 385
Ray, D. S., 191
Ray, P. D., 252, 255, 268, 269, 270, 286, 287, 288, 291
Ray, W. J., Jr., 715, 716
Razin, A., 216
Razin, S., 464, 476
Reckard, T., 535
Rector, F. C., 274
Reddy, W. J., 163
Redfield, B. G., 236, 237
Redfield, R. R., 705
Redwood, W. R., 484
Reed, D., 373
Reed, L. J., 393
Reed, W. P., 510
Reeder, R., 651, 653
Reedy, M. K., 536, 538
Reeke, G. N., 26, 32, 33, 34, 39, 41, 363, 367, 382
Rees, M. K., 528
Rees, M. W., 717
Rees, R., 677
Regen, D. M., 273, 280
Rehbinder, D., 308
Reich, E., 100
Reich, M., 470
Reichard, P., 191, 193, 206, 207, 208, 210, 211, 233, 234, 392
Reichmann, M. E., 143
Reider, R. F., 505
Reijnaers, H., 754
Reim, M., 254
Reineke, L. M., 672, 677, 682
Reiner, E. J., 153
Reinwein, D., 273
Reisfeld, R. A., 502
Reiss, J., 311
Reiter, H., 192
Rejman, E., 123
Remberger, U., 279
Remsen, C. C., 56, 70
Renaud, F. L., 524
Rendi, R., 489
Renkonen, O., 309, 316
Renold, A. E., 159, 166, 168
Renz, P., 232
Retey, J., 227, 228, 230
Revel, H. R., 414, 428
Revol, A., 676
Reyer, R. W., 645
Reynolds, G., 565
Reynolds, G. T., 601, 602, 619, 621
Reynolds, R. C., 157, 161
Rhi, M., 552, 556
Rhodes, W., 573
Rhodes, W. C., 598, 605, 606, 607
Ribadeau-Dumas, B., 772
Ricci, C., 372
Rice, R. V., 526, 530, 536, 537
Rice, S. A., 577, 579
Rich, A., 39, 425, 530, 647
Richards, E. G., 144, 529, 535
Richards, F. F., 509, 510, 512, 516
Richards, F. M., 26, 30, 31, 32, 37, 39, 40, 41, 43, 44, 45, 46, 360, 363, 365, 366, 383, 385, 515, 702
Richards, R. L., 334, 348, 349, 350
Richardson, C. C., 176, 192, 193, 194, 195
Richardson, D. C., 36
Richardson, S. N., 468, 469, 470
Richart, R. M., 647
Richaud, F., 87, 88
Richborn, B., 377
Richmond, M. H., 420, 421
Richter, J., 481, 484
Richter, W. R., 635
Rickenberg, H. V., 414, 424, 429
Rieche, A., 677
Rieder, R. F., 754, 773, 774
Riehm, J. P., 366, 708, 709
Rifkin, D. B., 750, 781
Rifkin, M. R., 750, 781
Riggs, A., 394, 746, 777
Riklis, E., 192
Riley, G. A., 149, 155
Riley, M., 190, 421
Riley, W. D., 151, 155, 158
Riley, W. H., 610, 612, 615, 616, 624
Rimon, A., 505
Rimon, S., 701
Rinaldi, A. M., 645, 729
Ringold, H., 385, 661, 662, 664, 666, 667, 668, 671, 681
Riordan, J. F., 34, 368, 699, 700, 703, 709, 710
Rippa, M., 704, 705
Ristau, O., 276
Ristow, S. C., 144
Ritossa, F. M., 641
Rizack, M. A., 151, 158
Robberson, B., 750, 751, 780
Robbins, E., 646, 647
Robbins, J. B., 505
Robbins, M., 192
Robbins, P. W., 261, 472, 473
Roberts, C. F., 103
Roberts, E. R., 347
Roberts, R. B., 115, 124
Roberts, S., 163
Roberts, T. L., 59
Robertson, C. R., 168
Robertson, J. D., 473, 477
Robinow, C. F., 54, 55
Robins, R. K., 441
Robinson, B. F., 160

Robinson, G. W., 572, 577
Robinson, W. G., 234
Robinson, W. S., 111, 122
Robison, A., 250, 274, 288, 289
Robison, G. A., 149-74; 149, 150, 151, 154, 156, 157, 158, 161, 164, 165, 166, 168
Rocchi, R., 708
Roche, J., 205
Rochovansky, O. M., 232
Rockey, J. H., 504, 505
Rockey, P., 415
Rode, L. J., 56, 70
Roder, A., 334
Rodriguez, A., 486
Rogers, P., 428, 614
Rognstad, R., 263
Roholt, O. A., 34, 45, 502, 516, 712, 761
Roitman, A., 320
Rojkind, M., 549, 552, 556, 564
Rolleston, F. S., 254, 260, 276, 280, 292
Rollins, F., 646
Roman, A., 413
Rome, E., 536
Romero, C. A., 486
Ronca, G., 704
Roos, P., 13
Rooze, V., 226, 227
Rörsch, A., 180, 181, 184, 192
Rosa, U., 711, 712
Rosas del Valle, M., 72, 75
Rose, I. A., 267, 275, 281, 292, 293
Roseman, S., 319, 478, 479
Rosemeyer, M. A., 754
Rosenbaum, N., 416
Rosenberg, A., 319, 448, 449, 451
Rosenberg, H., 318
Rosenberg, J. L., 625
Rosenbloom, F. M., 211, 212
Rosenbluth, R., 584, 585
Rosenheck, K., 447
Rosenkrantz, H., 59
Rosenthal, A. F., 307, 717
Rosenthal, O., 672, 673, 674, 675, 676
Rosenthal, S., 239, 240
Rosiere, C. E., 168
Rosmus, J., 554
Rosner, J. M., 670
Ross, B. D., 254, 255, 257, 260, 286, 288, 289, 291, 295
Rosseau, M., 56, 70
Rosselet, J. P., 672
Rosset, R., 110, 111, 119, 137
Rossi, M., 216, 217, 218, 335, 353
Rossi-Fanelli, A., 389, 394, 400, 452, 746
Rossman, T., 634
Rossmann, M. G., 26, 35, 36, 40, 363
Roswell, D., 599, 623
Roth, J. R., 422
Roth, J. S., 218, 219, 220
Rothfield, L., 463-96; 320, 471, 472
Rothfus, J. A., 736, 737, 779
Rotman, B., 414
Rotsch, E., 310
Rouser, G., 314, 318
Rouvière, J., 425
Rowbury, R. J., 93
Rowe, A. J., 523, 524, 526, 528
Rowen, R., 467
Rowley, D. B., 56, 59, 62
Rowley, P. T., 372, 705
Roy, J., 211
Roy, K. L., 146
Rubin, M., 398
Rucknagel, D. L., 777
Rudee, M. L., 556
Ruderman, N., 290
Rudin, D. O., 480, 481, 482, 483, 485, 486, 489
Rudloff, V., 746, 748, 750, 774
Rudman, D., 161
Rudner, R., 123
Ruggles, D. L., 565
Ruiz-Amil, M., 279
Rumen, N. M., 40, 45, 754
Rumley, M., 779
Rumsby, M. G., 320
Rumsey, P., 272
Rupert, C. S., 176, 185
Rupley, J. A., 365, 367, 712
Rupp, W. D., 180, 187, 188, 189
Russell, E. S., 777
Russell, G. J., 144
Russell, S., 333, 334, 337, 338, 341, 343, 344, 345, 346
Russey, W. E., 683, 684
Rutter, W. J., 645
Ruzicka, L., 683, 685
Ryan, E. M., 534, 537
Ryback, G., 683
Ryter, A., 55, 68, 72, 464, 465, 466, 479

S

Sacco, A., 335, 353
Sachsenmaier, W., 214
Sacks, L. E., 54
Sadler, J. R., 415, 416, 424
Sadoff, H. L., 59, 60, 61, 62
Saedler, H., 420, 426, 427, 428
Saier, M., 384
Saiga, Y., 598, 600, 601, 602, 603, 621, 622
Saito, H., 111
Saito, T., 335, 353
Sakabe, K., 191
Sakagami, T., 320
Sakagishi, P., 673
Sakai, H., 539, 645
Sakakibara, S., 732, 744
Salas, M., 167, 259, 261, 271, 293, 294, 413
Salas, M. L., 167
Salomone, R., 516
Salser, W., 425
Saltmarsh-Andrew, M., 472
Salton, M. R. J., 55, 464, 465, 476
Saludjian, P., 745
Salvatore, G., 65
Salway, J. G., 313
Samarina, O. P., 649
Samols, E., 166
Samosudova, N. V., 537
Sampath Kumar, K. S. V., 33, 780
Samson, F. E., 637, 641
Samuelsson, B., 625
Sanadi, D. R., 736, 739
Sanchez, C., 412
Sanchez, V., 486
Sanders, B. G., 500, 762, 769
Sanders, E., 672, 674, 675, 676
Sanders, T. G., 645
Sanderson, K. E., 423, 427
Sandhu, R. S., 165
Sandler, R., 163
Sanger, F., 110, 111, 126, 137, 140, 372, 440, 728, 776, 780
Sano, S., 732, 744
Sansone, G., 753
Santangelo, E., 63
Santer, M., 680
Sanukida, S., 469
Sanwal, B. D., 94, 201, 274
Sapezhinskii, I. I., 575
Sarabhai, A. S., 413
Sargent, E. J., 323
Sarid, S., 645, 654
Sarkar, P. K., 440, 441, 443, 446

Sarker, N., 110, 111
Sarma, V. R., 26, 37, 38, 39, 40, 41, 43, 44, 46, 363, 365, 373, 376, 377, 382
Sarnat, M. T., 413
Saroff, H. A., 366, 701, 702
Sartorelli, L., 535
Sasakawa, S., 750
Sasaki, H., 162
Sasaki, R., 705
Sasaki, R. M., 772
Sasisekharan, V., 37
Sastry, P. S., 306, 318
Satake, K., 705, 750
Satir, P., 525
Sato, C., 705
Sato, G. H., 634
Sato, H., 621, 679, 680
Sato, K., 423, 425, 428
Sato, R., 672, 673, 674, 711
Satoh, P. S., 677, 678
Sattin, A., 152, 155
Sauerbier, W., 181
Saukkonen, J., 430
Saunders, R. M., 313
Savage, J. E., 565
Savard, K., 150, 151, 163, 680, 682
Sawada, F., 710
Sawas, C., 85, 87, 89
Sayoc, E. F., 164
Scaife, J., 413, 416, 417
Scandella, C. J., 55
Scarano, E., 216, 217, 218, 219
Scarborough, G. A., 308, 479
Schachman, H. K., 151, 390, 391, 444
Schachter, H., 712, 715
Schaechter, M., 109
Schaedel, P., 414
Schaeffer, P., 52, 58, 66, 72, 74, 75
Schaefler, S., 421
Schaffer, N. K., 372
Scharff, M., 646
Schatz, A., 680, 682
Schaub, M. C., 526, 527, 537
Schechter, I., 389, 394
Scheich, T., 111
Scheid, A., 321
Schejter, A., 35, 732, 736, 738, 739, 744, 745, 754, 755, 774, 776, 777
Schellman, J. A., 46, 383, 388, 457, 458
Schenck, J. R., 635
Scheraga, H. A., 37, 38, 46, 126, 144, 366, 443, 445, 696, 700, 708, 709, 712
Scherphof, G. L., 320
Scherrer, K., 641, 650
Schiefer, H-G., 321
Schiffmann, E., 559
Schildkraut, C. L., 192, 193
Schimmel, R. P., 38
Schirch, L. G., 372
Schlesinger, M. J., 396
Schlesinger, S., 423
Schlessinger, D., 109, 113, 114, 116, 118, 429, 443
Schlossman, S. F., 508
Schlueter, R. J., 556
Schmid, A., 704
Schmid, H. H. O., 314
Schmid, K., 707
Schmid, R., 295
Schmidlin, J., 677
Schmidt, H., 286, 290
Schmidt, R. R., 219, 220
Schmier, I., 444, 445
Schmir, G. L., 711
Schmitt, F. O., 554
Schnebli, H. P., 211
Schneider, A., 555, 556
Schneider, A-M., 95
Schneider, K. C., 333, 334, 343, 345, 346, 347, 350
Schneider, W. C., 309
Schneider, Z., 231
Schneyer, C. A., 165
Schochetman, G., 210
Schoellman, G., 28, 46
Schoenborn, B. P., 41
Schoener, B., 151, 155, 282
Schoffa, G., 276
Scholes, G., 177
Schöllhorn, R., 335, 344, 348, 350
Schoner, W., 267, 268, 279, 285, 286, 287, 288, 290, 291, 296
Schrader, M. E., 716
Schramm, H. J., 29, 47
Schramm, M., 151, 165, 168
Schrauzer, G. N., 229, 241
Schreiber, W., 704, 718
Schröder, E., 510, 730
Schroeder, W. A., 746, 750, 751, 752, 773, 775, 780
Schroepfer, G. J., Jr., 672, 683
Schubert, A., 677
Schubert, D., 735
Schubert, K., 681
Schuegraf, A., 281
Schultz, G., 153, 154, 164
Schultz, J., 305
Schulz, D. W., 259, 263, 277, 280, 281
Schuster, T. M., 452
Schuurmans Stekhoven, F. M. A. H., 282
Schwartz, I. L., 151, 161
Schwartz, J. H., 372
Schwartz, M., 421, 685
Schwartz, R. S., 514
Schwartz, S. A., 735
Schwarz, B. E., 304
Schwarz, S., 677
Schweet, R., 413, 777
Schwenk, E., 689
Schwenker, R. P., 577
Scoffone, E., 700, 708
Scott, N. S., 168
Scott, R., 159
Scott, T. W., 314
Scouloudi, H., 40, 41
Scrimgeour, K. G., 236, 237, 239, 240, 241
Scrimger, S. T., 712
Scrutton, M. C., 249-302; 266, 268, 271, 274, 279, 290, 371
Sebek, O. K., 672
Seegmiller, J. E., 211, 212
Segal, H. L., 395, 709
Segal, M., 530, 534
Segal, S. J., 645
Sehgal, S. N., 467
Sehon, A. H., 510
Seibl, J., 230
Seibles, T. S., 709
Seidel, D. T., 528
Seidel, H., 144
Seidel, J. C., 535
Seiffert, I., 287
Seifter, S., 548, 549
Sekiguchi, M., 192
Sekine, T., 535, 708, 718
Sekiya, K., 534
Sekuzu, I., 470, 471, 702, 705
Sela, M., 498, 505, 506, 508, 708, 761
Selby, C. C., 536
Seldin, D. W., 274
Seliger, H. H., 598, 599, 601, 604, 605, 606, 608, 622, 624, 625
Sells, B. H., 119
Sells, R. A., 294
Sels, A., 780
Sen, S., 324
Senft, G., 153, 154, 164
Senoff, C. V., 335, 353
Seon, B. K., 717
Seraydarian, K., 152, 528
Serian, C., 757
Sesnowitz, S., 190
Sessa, G., 489
Setchell, B. P., 314
Setlow, B., 214, 215, 216
Setlow, J. K., 176, 178, 572
Setlow, R. B., 176, 177, 178, 180, 181, 183, 187, 189, 192, 572, 583, 589, 591, 592

Setsuda, T., 163, 168
Setzkorn, E. A., 709
Seubert, W., 267, 268, 279, 285, 286, 287, 288, 290, 291, 296
Seufert, W. D., 486
Shafa, F., 56, 70
Shaffer, B. M., 169
Shakulov, R. S., 113
Shalitin, Y., 373
Shall, S., 31
Shaltiel, S., 705
Shank, P. W., 161
Shannon, J. S., 100, 101, 391
Shapanka, R., 506
Shapiro, B(enjamin), 318
Shapiro, B(ernard), 80
Shapiro, B. M., 81, 391, 392, 397
Shapiro, J. A., 419, 420, 426, 427
Shapiro, M. B., 136
Shapiro, S. K., 90, 92
Shapiro, S. S., 513
Sharma, C., 259, 261, 271, 293, 294
Sharon, N., 365
Sharp, J. T., 556
Sharpless, K. B., 684, 685
Shaw, D. A., 682
Shaw, D. C., 372, 701
Shaw, E., 28, 46
Shaw, E. J., 319
Shaw, N., 310, 312, 319
Shechter, E., 46, 445, 446, 745
Sheehan, G., 309
Sheiner, L. B., 135, 136, 137
Shelanski, M. L., 524, 539
Sheldrick, P., 146
Sheltawy, A., 314
Shelton, J. B., 750, 751, 780
Shelton, J. R., 750, 751, 780
Shen, S. R-C., 219, 220
Shenstone, F. S., 324
Shepherd, D., 273, 290
Shepherd, W. C., 484
Sheppard, D., 418, 419
Sherman, F., 729, 736, 739, 745, 773, 780
Sherr, S. I., 309
Sherwood, L. M., 39, 778
Sherwood, M., 711
Shethna, Y. I., 337
Shibata, K., 705, 706, 710, 711, 713, 714, 715, 716
Shibata, S., 754
Shibuya, I., 476
Shieh, H. S., 309
Shields, G. S., 565, 702
Shigeura, H. T., 413
Shiio, I., 206, 216
Shikita, M., 679, 680
Shilov, A. E., 335, 353
Shilov, A. K., 335, 353
Shimada, T., 529
Shimada, Y., 646
Shimao, S., 678
Shimassek, H., 288
Shimazu, T., 161, 167
Shimizu, A., 754
Shimizu, K., 677, 678, 679
Shimizu, S., 228, 229, 233, 234
Shimojima, H., 677
Shimomura, O., 598, 600, 601, 602, 603, 605, 619, 621, 622, 623
Shinko, T., 164
Shinoda, K., 481
Shinoda, T., 493, 499, 705, 762, 763, 764, 766, 769, 771, 772
Shinton, N. K., 753
Shiokawa, K., 648
Shipley, R. A., 286
Shive, W., 83, 85, 89, 97, 425
Shockman, G. D., 464
Shombert, D. J., 625
Shonk, C. E., 257
Shonka, M. L., 274
Shore, V. C., 363
Shorey, C. D., 466, 467
Short, R. S., 575
Shoup, G. D., 213
Shrago, E., 252, 255, 268, 269, 270, 286, 287, 291
Shugar, D., 121, 136, 176
Shull, G. M., 677
Shulman, R. G., 571-96; 573, 574, 575, 576, 577, 580, 581, 582, 583, 586, 587
Shur, V. B., 335, 352
Shvetzov, Yu. A., 335, 353
Sibatani, A., 124
Siddons, R. G., 275, 285
Siebert, R., 677
Siedman, F., 153
Siegel, L., 266
Sieker, L. C., 26, 27, 30, 41, 334, 337
Sierra, G., 54, 59
Sigler, P. B., 26, 27, 29, 37, 40, 43, 44, 363, 367
Signer, E. R., 187, 413, 416, 423, 427, 428
Sih, C. J., 661-94; 671, 672, 676, 677, 679, 680, 681, 682
Silber, R., 216, 217, 219, 220
Silbert, D. F., 422, 426, 428
Silengo, L., 116, 118
Silver, W. S., 333, 334, 335, 344
Silverstein, R., 373
Silvester, D. J., 333, 334
Simet, L., 372
Simmons, N. S., 444, 445, 449, 450, 451
Simmons, R. J., 58
Simms, E. S., 193, 508, 509, 512, 514
Simon, G., 318
Simon, M. I., 179
Simoni, R. D., 306, 479
Simons, E. S., 451
Simpson, E. R., 678
Simpson, R. T., 368, 449, 450, 696, 700, 712
Simpson-Gildemeister, V. F. W., 589
Sims, E. A. H., 277
Simson, E., 179
Sinclair, J. H., 641
Sinex, F. M., 558
Singer, S. J., 46, 360, 453, 454, 474, 499, 507, 508, 515, 516, 699, 702, 703, 768
Singh, R. N., 333, 334, 345
Singhal, R. L., 251, 252, 259, 269, 270, 283, 291, 295
Singler, P. B., 448
Singleton, R., Jr., 382
Sinha, N. K., 717
Siniscalco, M., 754
Sinohara, M., 535
Sinsheimer, R. L., 177, 178, 191, 194, 195, 573, 575, 592
Sips, R., 509
Sisken, J. E., 638
Siskind, G. W., 504
Sitt, R., 153
Sjöquist, J., 735, 761
Sjöstrand, F. S., 473, 477
Sjovall, J., 666
Skinner, H. C. W., 44
Skinner, S. S., 286
Skrivanova, J., 154
Skursky, L., 666
Slade, A., 672, 675
Slagel, D. E., 310, 314
Slater, D. W., 645, 729
Slater, E. C., 395
Slaughter, C., 90
Slautterback, D. B., 470, 474, 475
Slayter, H. S., 531, 532, 533
Sleigh, M. A., 525
Sloan, J. D., Jr., 59, 61
Sloane, R. W., Jr., 509
Slobin, L. I., 515, 516
Sloger, C., 333, 334, 335, 344
Slonimski, P. P., 98, 100, 780
Sluyterman, L. A. E., 701, 716
Small, P., 529, 530

Small, P. A., Jr., 39, 502
Smalley, K. N., 608
Smeby, R. R., 324
Smiley, K. L., Jr., 215
Smillie, L. B., 28, 372
Smit, J. A., 90
Smith, A. D., 310
Smith, B. A., 85
Smith, C. D., 95
Smith, C. J., 138
Smith, D. B., 750
Smith, D. S., 608
Smith, D. W., 480
Smith, D. W. E., 426, 428
Smith, E. E., 261
Smith, E. L., 35, 225, 240, 241, 702, 729, 731, 734, 735, 736, 737, 738, 739, 741, 744, 745, 746, 772, 776, 777, 778, 779
Smith, E. W., 777
Smith, G. M., 754
Smith, G. P., 516
Smith, I., 111, 122, 124, 648, 649
Smith, J. D., 132, 133
Smith, J. M., 157
Smith, J. W., 553
Smith, K. C., 176, 178, 185, 572
Smith, L., 65
Smith, L. C., 97, 239, 240
Smith, L. F., 728
Smith, L. L., 677
Smith, M., 153
Smith, M. E., 304
Smith, M. H., 703
Smith, P. F., 467
Smith, R. H., 565
Smith, S. G., 377
Smith, W. J., 85
Smithies, O., 499, 768, 769, 771, 773, 774, 775
Smyth, D. G., 31, 708, 779
Smyth, D. S., 760, 762
Snell, E. E., 370, 372, 373
Sneyd, J. G. T., 150, 159
Snoke, R. E., 295
Snyder, F., 317
Sober, H. A., 508
Sobotka, H., 711
Soderberg, B. O., 35, 36, 44
Sodja, A., 779
Sokal, J. E., 159
Sokolovsky, M., 34, 709, 710
Solari, A. J., 539
Soling, H. D., 290
Söll, D., 781
Sollman, T., 158
Solomon, S., 678
Sols, A., 167, 259, 261, 271, 281, 292, 293, 294
Solyom, A., 158
Somerville, R. L., 424
Somlo, M., 780
Song, K. M., 335, 353
Sonneborn, T. M., 773
Sonnenfeld, V., 610
Sörm, F., 28, 717, 779
Søvik, O., 161, 167
Sowinski, R., 600
Spahr, P. E., 109, 110, 112
Spande, T., 707, 716
Spanner, S., 307, 315
Speake, R. N., 288, 290
Spears, C. L., 181
Spears, D., 309
Spencer, S., 287, 291
Spicer, S. S., 534
Spiegelman, S., 110, 122, 143, 413, 425, 635, 641, 645, 729
Spirin, A. S., 113, 114, 116, 118, 120, 645, 650
Spiro, R. G., 556
Spitnik-Elson, P., 112, 114
Spizizen, J., 52, 72, 74
Spolter, P. D., 279
Spotts, C. R., 68
Spottswood, T., 424, 429
Spragg, J., 509, 510
Sprecher, M., 227
Springell, P. H., 711
Sprinson, D. B., 98, 227
Sprössler, B., 100
Sprouse, H. M., 293
Spudich, J. A., 51-78; 54, 55, 56, 59, 67, 68, 69, 70, 71, 72, 73, 614, 615
Squires, C., 419
Srere, P. A., 278, 381
Sreter, F. A., 535
Sridhara, S., 413
Srinivasan, P. R., 100
Srinivasan, V. R., 52, 60
Srivastava, S. K., 269, 291, 295
Stachel, H. D., 601
Stachow, C. S., 274
Stackiw, W., 484
Stadtman, E. R., 80, 81, 82, 83, 84, 202, 294, 212, 243, 244, 250, 269, 360, 390, 391, 392, 397, 465
Stadtman, T. C., 225, 232, 233, 241, 242, 245, 680
Staehelin, M., 131, 162
Staehelin, T., 114, 125
Stafford, W. S., 288
Stahl, F. W., 183, 427, 429
Stambrook, P. J., 638
Stamm, N. B., 251, 252, 259, 269, 270, 283, 284, 291, 295
Stanacev, N. Z., 313, 318
Stanbury, J. B., 644, 651
Standish, M. M., 489
Stanier, R. Y., 624
Stanley, W. M., Jr., 110, 125, 413
Staple, E., 679
Stapleton, I. W., 447
Stapleton, R., 424
Staprans, I., 527
Starcher, B., 565
Starcher, B. C., 559, 561
Stark, G. R., 701
Starlinger, P., 420, 427, 428
Starman, B. L., 191
Stasny, J., 476, 477
Staub, M., 97
Stavy, L., 643
Steele, R., 293
Steele, R. H., 575, 599, 626
Steere, A., 479
Steers, E., Jr., 416
Stefanovic, V., 671
Steffen, J., 638
Steigbigel, N. H., 181
Steim, J. M., 320, 475
Stein, O., 321
Stein, W. H., 31, 33, 46, 365, 701, 706, 708, 715, 779
Stein, Y., 321
Steinberg, W., 52, 62, 63, 64
Steiner, D. F., 161, 167
Steiner, L. A., 507, 508, 509, 517, 760, 761, 762, 767
Steiner, R. F., 702, 707, 711, 715
Steinmetz-Kayne, M., 762
Steinschneider, A., 143
Steitz, T. A., 26, 32, 33, 34, 39, 41, 363, 367, 382
Stekol, J. A., 240
Stellwagen, E. C., 717, 718
Stelob, P., 702
Stent, G. S., 124, 176, 177, 413, 426, 429
Stephen, M. J., 578
Stephens, R. E., 524, 525
Sterky, G., 294
Stern, H., 214, 638
Stern, R., 155, 158
Stetten, M. R., 294, 295
Steven, F. C., 701
Stevens, A., 117, 120
Stevens, F., 737, 776, 779
Stewart, B. T., 58, 59, 60, 61
Stewart, F. H. C., 447

Stewart, J. A., 651, 653
Stewart, J. M., 510
Stewart, J. W., 729, 736, 737, 745, 773
Stewart, W. D. P., 332
Still, J., 751
Stirewalt, W. S., 653
Stjerholm, R., 227
Stock, K., 156, 158, 159, 160, 168
Stodolsky, M., 413
Stoeckenius, W., 467, 474
Stoffel, W., 321
Stone, D. B., 150, 151, 155, 157
Stone, K. J., 686
Stone, M. J., 514
Stoolmiller, A. C., 372
Stotz, E., 312, 466, 467
Stouffer, J. E., 700
Stouthamer, A. H., 93
Stracher, A., 521, 529, 530, 716
Strandberg, B., 26, 34, 39, 41, 43, 363, 448
Strandberg, B. E., 363, 746
Strandberg, G. W., 343, 345
Strandberg, R., 26, 34, 39, 41, 43, 363, 448
Strange, R. E., 55, 56, 59, 60
Strauss, B. S., 176, 192
Strehler, B. L., 610, 612, 614, 615
Streisinger, G., 144, 190, 413, 729, 773
Stretton, A. O. W., 413, 750, 776
Strickland, K. P., 310, 313
Strickler, S. J., 574
Strittmatter, P., 705, 779
Strom, R., 470, 471
Stromer, M. H., 526, 537
Strominger, J. L., 472
Struck, E., 287, 288, 289, 290
Strumeyer, D. H., 715
Stryer, L., 25-50; 40, 41, 42, 43, 46, 363, 386
Stryker, V. H., 717, 718
Stuart, A., 131, 132
Stuart, E. S., 547, 653
Stuart, P. F., 70
Stullberg, M. P., 146
Stumpf, B., 267, 286, 287, 288, 291
Stumpf, P. K., 306
Stupp, Y., 506
Stutts, P., 211
Subrahmanyam, K., 287, 288
Subramanian, D., 334, 340, 342, 344, 345, 351
Sue, F., 279, 285, 296
Suelter, C. H., 215, 382, 529
Sueoka, N., 56, 122, 124, 144
Sugimoto, E., 705
Sugino, Y., 220
Sugiura, M., 142
Sugiura, S., 600, 601
Sugiyama, T., 143
Suglura, M., 110, 111
Suld, H. M., 679
Sult, V., 713
Summerson, W. J., 372
Sun, C-J., 526
Sun, J. Y., 335, 353
Sundararajan, T. A., 413
Suran, A. A., 762, 768
Surdin, Y., 86, 88
Suskind, S. R., 105
Sussman, A. S., 52, 53, 56
Sussman, K. E., 151, 166
Sussman, M., 637, 645, 646, 654
Susuki, E., 447
Sutherland, E. W., 149-74; 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 162, 163, 164, 165, 166, 168, 250, 274, 288, 289
Suzuki, F., 119, 226, 227
Suzuki, H., 119, 120
Suzuki, I., 109
Suzuki, K., 626, 673, 674, 679
Suzuki, M., 706
Suzuki, T., 759
Svedmyr, N., 155, 168
Svendsen, I., 701, 710
Svensson, H., 9
Sveshnikova, E. B., 578
Swain, C. G., 371
Sweeley, C. C., 472
Sweeney, A. R., 621
Sweeney, B. M., 621
Sweeney, H. M., 421
Sweetman, B. J., 717
Swenson, P. A., 187
Switzer, R. L., 205, 226, 227
Swoboda, J. J., 685
Sykes, J., 119, 124
Sypherd, P. S., 117, 120, 121, 123
Szent-Györgyi, A. E., 575
Szent-Györgyi, A. G., 526, 529, 531, 533
Szer, W., 121
Szewczuk, A., 706, 708
Szilagyi, J. F., 307
Szilard, L., 768
Szolyvay, K., 427
Szulmajster, J., 56, 57, 58, 59, 60, 64, 65, 66, 68, 69, 73, 89
Szybalski, W., 179

T

Tabachnick, I. I. A., 153
Taber, H., 780
Tachibana, A., 706
Taft, H. L., 294, 295
Taft, R. W., Jr., 379
Tagawa, K., 333, 334, 341
Tahara, M., 94
Tai, H. H., 679
Tait, G. H., 716
Takada, A., 718
Takagi, A., 70
Takagi, Y., 192
Takahashi, H., 60, 111
Takahashi, I., 52, 56, 57, 74
Takahashi, K., 164, 706, 708
Takahashi, S., 717
Takaishi, K., 57
Takanami, M., 109, 110, 111, 124, 125, 126, 142, 143
Takano, T., 187
Takashina, H., 703
Take, T., 705
Takeda, Y., 60, 119
Takemori, S., 626, 702, 705, 745
Takenada, O., 710
Takeo, K., 539
Takeshita, M., 471
Taketa, K., 279, 284
Takeuchi, K., 534
Takeyama, S., 236
Talal, N., 514
Talalay, P., 661, 662, 668, 669, 671, 680, 682
Talamo, B., 319
Talamo, R., 510
Tamao, Y., 233, 234
Tamaoki, B., 674, 679, 680
Tamaoki, H., 714
Tamaoki, T., 142
Tamir, H., 71
Tan, P-H., 526
Tanahashi, N., 778
Tanaka, A., 275, 285
Tanaka, M., 334, 678, 772, 775
Tanaka, S., 57, 478
Tanaka, T., 253, 269, 271, 279, 283, 285, 296
Tanford, C., 46, 502, 503, 506
Tani, I., 57
Taniguchi, K., 60
Taniguchi, S., 666
Tanino, S., 154, 161
Taniuchi, H., 779
Tannenbaum, S. W., 506
Tanzer, M. L., 552, 554, 563, 566

Tappel, A. L., 625
Tarczy-Hornoch, K., 535
Tarr, H. L. A., 211
Tarrant, M. E., 288
Tashjian, A. H., Jr., 715
Tata, J. R., 275
Tatibana, M., 203, 204
Tauregui-Adell, J., 363
Taylor, C. B., 253, 271, 279, 296
Taylor, E. C., 601
Taylor, E. W., 524, 539
Taylor, J., 481, 483
Taylor, K., 292
Taylor, K. W., 167
Taylor, P. M., 261
Taylor, R. T., 91, 92, 236, 237, 238, 239, 240, 241
Taylor, W. D., 177, 625
Tazaki, K., 705
Tchen, T. T., 677, 678, 679, 685
Tchola, O., 372, 705
Teale, F. W. J., 46, 572
Telford, J. M., 158
Telka, M., 702
Telser, A., 558, 567
Temmerman, J., 142
Tener, G. M., 138, 146
Teorell, T., 480
Tepper, M., 177, 182
Terman, S. A., 652
Terminiello, L., 699
Terry, R., 467
Terry, T. M., 476
Terzaghi, E., 144, 190, 413, 729, 773
Tessman, E. S., 191
Tessman, I., 177, 187
Testa, R., 60
Thach, R. E., 413
Thelander, L., 206, 207
Theorell, H., 35, 36, 44, 45, 385, 666, 732, 744, 745
Theriot, L., 179, 180, 184, 185
Thoma, J. A., 360, 371, 373, 377, 381, 389
Thoma, R. W., 682
Thomas, J., 558, 565, 567
Thomas, P. J., 323
Thompson, E. B., 645
Thompson, E. O. P., 780
Thompson, G. A., Jr., 317, 318
Thompson, R. B., 754
Thompson, T. E., 481, 483, 484, 486
Thompson, U. B., 213
Thompson, W., 313, 314
Thorbecke, G. J., 759
Thornhill, D., 563
Thorpe, N. O., 501, 515, 516, 767
Threlfall, C. J., 261
Tibbs, J., 523, 525
Tieffenberg, M., 485
Tien, H. T., 480, 481, 482, 483, 485
Tilander, B., 26, 34, 39, 41, 43, 363, 448
Timasheff, S. N., 445, 446, 447
Timms, A. R., 158
Tinker, D. O., 309
Tinoco, I., Jr., 113, 437, 438, 439, 440, 441, 442, 443, 444, 445, 456, 586, 587
Tinoco, J., 309
Tisdale, H. D., 468
Tiselius, A., 1-24; 3, 4, 5, 7, 10, 12, 14, 15, 19, 21
Tissières, A., 109, 110, 112
Titani, K., 498, 499, 501, 705, 734, 737, 762, 763, 764, 766, 769, 771, 772, 776
Tobari, J., 471
Tocchini-Valentini, G. P., 413
Todd, C. W., 501
Toennies, G., 464, 715
Toi, K., 713
Tokiwa, T., 529, 534
Tokura, S., 534
Tokuyama, H., 532
Tokuyasu, K., 70
Tolbert, B., 279
Tomasek, V., 779
Tomasi, V., 309
Tominaga, K., 761
Tomizawa, J. I., 177, 190
Tomkins, G. M., 428, 645
Tomlinson, R. V., 138
Tono, H., 59, 61, 62
Tonomura, Y., 529, 530, 532, 534, 535, 536, 705
Toohey, J. I., 225
Tooney, N., 446, 447
Torbert, J. V., 777
Torres, H. N., 167
Torres-Gallardo, J., 145
Torriani, A., 64, 424
Tosteson, D. C., 481, 484, 485
Totsuka, T., 539
Totter, J. R., 597, 610, 612, 618
Toubiana, R., 688
Townend, R., 446, 447
Tranielo, S., 704
Traub, P., 109, 114, 125
Traut, R. R., 112
Travis, D. F., 556
Travis, J., 385, 604, 607, 708, 779
Trayer, I. P., 530, 535
Trayser, K. A., 274, 384
Trebst, A., 334
Tregear, R. T., 521, 538
Tremaine, J. H., 709
Trimmer, B. M., 154
Triner, L., 161
Trivedi, B., 274
Tropp, B. E., 324
Trotta, P., 529, 530
Trudgill, P. W., 626
Truett, W. L., 677
Truffa-Bachi, P., 79-108; 85, 87, 88, 89, 392
Trupin, J. S., 84
Tryfiates, G. P., 151, 154
Tsai, H. J., 745
Tsai, R. L., 673, 676
Tsan, Y-C., 59
Tsao, T-C., 526
Tsernoglou, D., 45, 363, 365
Tsibris, J. C. M., 673
Ts'o, P. O. P., 539
Tsong, Y. Y., 679, 681, 682
Tsou, Y-S., 526
Tsuboi, M., 447
Tsugita, A., 60, 144, 190, 413, 729, 754, 773, 779
Tsuji, F. I., 600
Tsuji, S., 164
Tsujimoto, A., 154, 161
Tsunoda, J. N., 709, 779
Tsuru, D., 72
Tu, L., 114
Tuan, D. Y. H., 647, 648
Tubbs, R. K., 590
Tucci, A. F., 529
Tulloss, I., 731, 737, 776, 777
Tuppy, H., 709, 737, 738, 745, 779, 780
Turba, F., 372, 702, 703
Turfitt, G. E., 680
Turner, G. L., 333, 334, 337, 344
Turner, M. K., 210, 211
Turnock, G., 119, 121
Turtle, J. R., 158, 161, 164, 166
Tuttle, R., 157
Tyler, A., 634, 640, 651
Tyuma, I., 449, 452, 754
Tzagoloff, A., 471

U

Uchida, A., 56
Uchida, Y., 335, 353
Udenfriend, S., 312
Uemura, T., 55
Uesseler, H., 98, 99, 100
Uhing, E. H., 709

Ukhin, L., 335, 353
Ullman, A., 413, 415, 416, 427
Ulmer, D. D., 46, 448, 673, 700
Umani-Ronchi, A., 230
Umbarger, H. E., 381, 390
Underwood, A. H., 254, 257, 271, 279, 283, 284
Unger, R. H., 166, 168, 288
Unowsky, J., 120
Urbain, J., 508
Urnes, P. J., 46, 366, 448
Urry, D. W., 448, 449, 453, 454, 474
Usami, Y., 532
Ushakov, A. N., 318, 324
Utsumi, S., 760, 761, 762
Utter, M. F., 249-302; 252, 266, 267, 268, 269, 271, 272, 274, 279, 285, 290, 296, 371
Uziel, M., 47, 366

V

Vaerman, J-P., 760
Vagelos, P. R., 304, 305, 306
Vail, M. H., 211
Valadares, J. R. E., 156
Valenta, J. R., 682
Valentine, R. C., 81, 279, 334, 336, 341, 344
Vallee, B. L., 34, 46, 368, 449, 450, 673, 696, 699, 700, 703, 709, 710, 712, 716
Vallotton, M., 509, 510
Vamos, N., 155
Van Alstyne, D., 709
Vanaman, T. C., 777, 778
van Deenen, L. L. M., 309, 310, 311, 312, 320, 322, 466, 485
van de Meene, J. G. C., 169
van den Berg, H. J., 486
van de Putte, P., 179, 184
Vanderberg, J., 647
Van der Gen, A., 685
van der Kamp, C., 192
Van Der Waard, W. F., 676
Vaněček, J., 779
Van Eijk, H. G., 528
van Golde, L. M. G., 309
Van Holde, K. E., 441, 586, 587
Van Iterson, W., 464
Vanker, P., 124
Vanneste, M., 673, 675
van Rapenbusch, R., 87
Van Rotterdam, J., 28
van Sluis, C. A., 179
van Tamelen, E. E., 683, 684, 685
van Vliet, G., 751
Van Vunakis, H., 179, 712
van Winden, M., 181
Van Winkle, C., 590
van Zutphen, H., 485
Van Zyl, A., 711
Varnum, J. C., 26, 34, 39, 363, 448, 745
Varricchio, F. E., 270
Vary, J. C., 52, 59
Vasil, I. K., 214
Vaska, L., 676
Vassalli, P., 505
Vassil'ev, R. F., 599
Vastine, F., 335, 353
Vatter, A. E., 619
Vaughan, G. D., 151, 166
Vaughan, M. H., Jr., 761
Vaver, V. A., 318, 324
Vavra, J., 268
Vecchio, D., 166
Veis, A., 553, 556, 557
Velick, S. F., 268, 281, 395
Velluz, C., 445, 451
Venetianer, P., 428
Venkstern, T. V., 131, 132, 136, 441
Ventaraman, R., 372
Vergin, M., 620, 621
Vermeulen, C., 123
Vernon, C. A., 365
Vibert, P. J., 536
Viennet, R., 450
Vilain, C., 513
Villar-Palasi, C., 167
Vinograd, J., 539, 640
Vinogradov, S. N., 35, 699, 702, 745
Vinter, V., 56, 68, 70
Vinuela, E., 167, 259, 261, 271, 281, 293, 294
Vischer, E., 671, 677
Vise, A. B., 93
Vithayathil, P. J., 30, 366, 702
Vitols, E., 201-24; 208, 209, 233, 235, 236
Vittorelli, M. L., 645
Vivian, S., 563
Vladimirov, I. A., 591
Voet, J., 373
Vogel, H. J., 413, 424, 646
Vogel, J. A., 157
Vogel, R. H., 413, 424
Voigt, B., 386, 389, 394
Volcani, B. E., 308
Volchek, B. Z., 447
Vol'kenshten, M. V., 395
Voll, M. J., 777
Volpe, A., 535
Vol'pin, M. E., 335, 352
von Chak, D., 528
von Ehrenstein, G., 747, 750, 780, 781
von Hippel, P. H., 548
von Holt, C., 286
von Wettstein, G., 774
Vorbeck, M. L., 319
Vorhaben, J. E., 626
Vournakis, J. N., 144
Vreeman, H. J., 484
Vulliemoz, Y., 158, 161, 168

W

Wacker, A., 176, 177, 415
Wacker, W. E. C., 700
Wada, H., 266
Wada, K., 645, 702, 705, 745
Waddell, W. J., 274
Waddington, C. H., 631, 632
Wade, H. E., 113
Wagner, A. F., 225
Wagner, F., 225, 227
Wagner, O. W., 229
Wagner, R. P., 94, 95
Wahba, A. J., 413
Wainio, W., 470
Waite, M., 320
Waites, W. M., 67, 68, 71, 72, 73
Wake, R. G., 56, 59
Wakid, N., 293
Waksman, S. A., 646
Walasek, O. F., 737, 780
Wald, R., 320
Walker, B. L., 315
Walker, D. G., 259, 261, 271, 292, 293, 294
Walker, H. W., 55
Wallace, B. J., 97, 98, 100, 105
Wallace, H., 641
Wallace, J. C., 274, 279, 290
Wallach, D. F. H., 453, 454, 465, 470, 474
Wallen, P., 735
Wallenfels, K., 414, 429
Waller, G., 666
Waller, J. P., 112, 113
Walsh, K. A., 33, 700, 728, 774, 777, 779, 780
Walter, J. E., 455, 456
Walter, P., 266
Walton, G. M., 400
Wang, J. H., 43, 274
Wang, K. C., 679, 681, 682
Wang, L. C., 333, 334, 345
Wang, S. F., 668
Wang, V. S., 668
Wanka, F., 214
Ward, J. F., 177

Ward, M. G., 670, 671
Ward, P. C. J., 536
Warms, J. V. B., 267, 275, 281, 292, 293
Warner, J. R., 642, 648
Warner, R. C., 227
Warren, L., 465
Warren, S., 35, 36, 363, 372
Warren, S. C., 67, 68, 71, 72, 73
Warshaw, M. M., 437, 438
Warth, A. D., 55, 68
Wassink, E. C., 617, 618
Watanabe, E., 600, 601
Watanabe, S., 527, 539
Watari, H., 674
Waterfield, M. D., 516
Waters, J. R., 601, 602
Watkins, J. C., 489, 490
Watkins, J. F., 651
Watson, H. C., 36, 37, 40, 41, 42, 43, 363, 386, 452, 746, 747, 750, 754
Watson, J. D., 109, 117, 118, 119, 190
Watson, M. L., 286
Watson-Williams, E. J., 777
Watters, J. A., Jr., 700
Watts-Tobin, R. J., 773
Waxdal, M. J., 498, 499, 517, 767
Weatherall, D. J., 753, 777
Weber, A., 521, 527, 534, 537
Weber, B., 158
Weber, C. S., 641
Weber, E. J., 318
Weber, G., 46, 251, 252, 259, 269, 270, 283, 284, 286, 291, 295, 381, 572, 610, 611, 612
Weber, H. H., 528
Webster, R. E., 427, 777, 780
Weeds, A. G., 529, 530, 532, 533
Wegienka, L. C., 166
Wegman, J., 102
Weibull, C., 13, 464, 522
Weigert, M. G., 143, 776
Weigle, J. J., 190
Weiher, J. F., 334, 337
Weil, L., 702, 709, 716
Weiler, E., 504
Weill, G., 589, 590
Weinbaum, G., 324
Weinberg, R., 419
Weinberg, R. A., 648
Weinblum, D., 177
Weiner, H., 715
Weiner, I. M., 472
Weinhouse, S., 259, 261, 271, 279, 289, 293, 294
Weintraub, A., 672, 682
Weinzierl, J. E., 26, 34, 39, 363, 448, 745
Weir, R. C., 759, 767
Weisblum, B., 781
Weiser, M., 471
Weiss, B., 150, 152, 154, 158, 159, 160, 194, 195
Weiss, J., 177
Weiss, L., 272, 273, 290
Weiss, L. J., 737, 776
Weiss, S. B., 111, 122, 309, 413
Weissbach, H., 91, 92, 225, 236, 237, 238, 239, 240, 241
Weissler, A. M., 157
Weissman, N., 565
Weissman, S. I., 578
Weissman, S. M., 137
Weissmann, G., 489
Weith, H. L., 143
Weitzman, P. D. J., 204, 717
Weller, D. L., 113
Wells, B., 441, 443
Wells, H., 165, 168
Wells, M. A., 310, 314
Wells, W. W., 305
Wendt, G., 307
Wenke, M., 158, 160, 304
Werbin, H., 669, 670
Wertheimer, H. E., 291
Wescott, W. C., 480, 481, 482, 483, 485
Wessels, N. K., 653
Westaway, E. G., 93
Westenbrink, H. G. K., 528
Westermann, E., 156, 158, 159, 160, 162, 163, 168
Westhead, E. W., 716
Westheimer, F. H., 370, 371, 372, 376
Westphal, A., 714
Wettstein, A., 671, 677
Wexler, S., 625
Wharton, D., 470
Wheeldon, L., 481, 483
Whelan, W. J., 261
Whichelow, M. J., 294
Whipple, M. B., 478
Whitaker, J. R., 704
White, A. E., 119
White, E. H., 599, 604, 606, 623
White, F. H., Jr., 703
White, G. L., 313
White, J. C., 729
White, J. R., 124
White, L., 287
White, M. N., 97, 425
Whitehouse, H. L. K., 650, 768, 771, 772
Whiteley, A. H., 644
Whiteley, H. R., 94, 644
Whitfeld, P. R., 143
Whitfield, H. J., Jr., 426, 427, 428, 777
Whitley, E., Jr., 501, 762, 763, 764, 766
Whitlock, H. W., Jr., 661-94; 681
Whitney, P. L., 506, 702
Wiame, J. M., 202, 203, 424
Widdowson, J., 112
Wieland, O., 268, 272, 273, 287, 288, 289, 290
Wieland, T., 708
Wiener, E., 745
Wigfield, D. C., 669
Wikler, M., 498, 499, 762, 763, 764, 766, 769, 771, 772
Wilchek, M., 707, 708
Wilcox, P. E., 700, 702, 708
Wild, D. G., 119, 120
Wild, F., 710
Wilhelm, R. C., 780
Wilkie, D. R., 521
Wilkins, B. M., 189
Wilkins, M. H. F., 113
Wilkinson, J. M., 499, 503, 510, 767
Will, G., 26, 40, 363
Willard, M., 428
Willems, M., 648
Willet, J. D., 684, 685
Willets, N., 184
Williams, A., 372
Williams, B. J., 157, 162, 167
Williams, D. C., 219
Williams, D. H., 676
Williams, G. R., 477, 745
Williams, J. N., Jr., 714
Williams, J. S., 279
Williams, M. G., 56, 70
Williams, P. J. le B., 307, 308
Williams, R. C., 501
Williams, R. H., 166, 167
Williams, R. J. P., 238, 351
Williams, R. W., 177, 183, 188
Williams, S. S., 214
Williams, V. R., 716
Williamson, A., 502
Williamson, D. H., 268, 276, 277
Williamson, J. R., 154, 156, 157, 167, 259, 272, 273, 274, 276, 277, 280, 281, 282, 285, 288, 289, 290, 291, 292
Willson, C., 124, 414, 415, 417
Wilson, C. B., 310, 314
Wilson, C. W., 137, 138, 139

Wilson, D. A., 103
Wilson, D. B., 423
Wilson, D. E., 279
Wilson, I. B., 204, 370, 371
Wilson, J. B., 750, 751, 757, 758, 780, 781
Wilson, P. W., 332, 333, 334, 335, 337, 338, 343, 345, 346
Wilson, T., 625
Wilson, T. G. G., 347
Wilt, F. H., 635, 637, 643, 645, 653
Windgassen, R. J., 229, 241
Winfield, M. E., 352
Winicur, S., 534, 537
Winkler, H., 310
Winslow, R. M., 780
Winstein, S., 377
Winter, H., 334, 339, 341
Winter, H. C., 346, 350
Winter, W. P., 728, 774, 777, 779
Winterfeld, M., 314
Winterhalter, K. H., 452
Wintersberger, E., 709
Winzler, R. J., 556
Winzor, D. J., 400
Wiren, G., 26, 34, 39, 41, 43, 363, 448
Wirsching, W., 702
Wirtz, G. W., 604, 605
Wissler, F. C., 761, 762
Witkop, B., 698, 707, 708, 716
Witter, A., 709
Wittkop, J., 250
Wittmann, H. G., 644, 729, 773
Wittmann-Liebold, B., 570, 729, 773
Witz, D. F., 333, 334, 335, 338
Witzke, H., 599, 625
Woernely, D. L., 761
Woese, C. R., 63
Wofsy, L., 515, 703
Wohl, R. C., 754, 773, 774
Wold, F., 47, 698, 703
Wolf, G. D., 321
Wolfe, R. G., 268
Wolfe, R. S., 241, 242, 243
Wolff, J., 711, 712
Wolin, E. A., 241, 242
Wolin, M. J., 241, 242
Wollenberger, A., 276
Wolpert, L., 634
Wolstenholme, D. R., 639
Wolthers, B. G., 26, 35, 39, 363, 448
Wong, P. C. L., 212
Wong, R. C., 779
Wood, B. J. B., 307
Wood, F. C., 166
Wood, H. G., 227, 243, 244, 294
Wood, J. M., 241, 242, 243
Wood, W. A., 250, 372, 704
Woodford, M., 257, 280
Woods, D. D., 92, 93, 236, 237, 239, 240, 241
Woods, E. F., 526
Woodward, D. O., 468, 469
Woody, R. W., 441
Wool, I. G., 648, 653
Woolfolk, C. A., 80, 391, 392
Woolhouse, B. A., 31
Worcel, A., 201
Work, T. S., 469, 470
Worther, H., 604
Worthington, C. R., 478, 536
Wright, A., 472, 473
Wright, B., 636, 654
Wright, H. T., 367
Wright, M. R., 578
Wu, H. C. P., 420
Wu, R., 194, 254, 281, 284
Wulff, K., 81, 82
Wuster, K. H., 279, 285, 296
Wyckoff, H. W., 26, 31, 32, 37, 39, 40, 41, 43, 45, 363, 365, 366, 383, 515
Wykes, J. R., 213
Wyman, G. M., 599
Wyman, J., 46, 97, 218, 362, 389, 390, 394, 396, 397, 400, 754
Wyman, J., Jr., 746
Wyngarrden, J. B., 205, 391, 397

Y

Yaffe, D., 646, 653
Yagi, K., 44, 510, 532, 534, 705
Yahara, I., 447
Yakulis, V., 759
Yamada, E., 70
Yamada, S., 714
Yamada, T., 645
Yamagami, K., 707
Yamaguchi, M., 535, 750
Yamaguchi, Y., 750
Yamakawa, T., 55
Yamamoto, A., 335, 353
Yamamoto, K., 651, 754
Yamamoto, T., 539
Yamamura, Y., 754
Yamana, K., 648
Yamanaka, T., 736, 739
Yamane, T., 228, 229, 575, 580, 581, 582, 583, 586, 587, 588
Yamano, T., 673
Yamashina, I., 735
Yanagisawa, T., 524
Yaneda, M., 60
Yang, J. T., 440, 441, 443, 445, 446, 447, 448
Yang, S. F., 322
Yaniv, M., 425
Yankeelov, J. A., Jr., 360, 371, 377, 381, 389, 714
Yankofsky, S. A., 110, 122
Yanofsky, C., 101, 102, 103, 104, 144, 393, 413, 422, 423, 424, 426, 427, 428, 729, 730, 772, 773, 780
Yaoi, Y., 734, 737, 776
Yaris, M., 592
Yarmolinsky, M. B., 414, 419, 428, 429
Yaron, A., 508
Yasuda, H., 626
Yasumura, Y., 634
Yasunobu, K. T., 72, 334, 709, 737, 772, 775, 779
Yates, D. W., 273, 290
Yates, R. A., 390, 391
Yazawa, Y., 532
Yefremenko, M. V., 523, 525
Yelin, E. A., 676
Yengoyan, L. S., 318, 683
Yokoyama, M., 535
Yonetani, T., 44, 45, 385
Yorka, K. V., 677
Yoshida, A., 61
Yoshida, K., 116, 117, 119, 120, 121
Yoshida, N., 57, 699
Yoshida, T., 286
Yoshikawa, H., 56, 162
Yoshimoto, A., 169
Yoshimura, J., 534, 705
Yoshinaga, K., 151, 155
Young, C. W., 210
Young, D. M., 532, 533, 703
Young, E. T., 194
Young, G. O., 501
Young, I. E., 56, 57, 68, 70
Young, M., 528, 530, 533, 534
Young, M. R., 279
Young, N. L., 428
Yugari, Y., 89
Yunis, A. A., 156, 157
Yura, T., 424
Yuster, P., 578

Z

Zabin, I., 413, 428

Zachau, H. G., 131, 132, 133, 135, 136, 137, 144, 146
Zagalak, B., 230
Zahler, P. H., 453, 454, 470, 474
Zahler, W. O., 306
Zahnd, G. R., 166
Zalkin, H., 308, 309, 469, 470
Zamecnik, P. C., 701, 704
Zamir, A., 131, 132, 133, 136, 146
Zappacosta, S., 512
Zarlengo, M. H., 502
Zavelgelsky, G. B., 441
Zavodsky, P., 395
Zehavi-Willner, T., 110, 111
Zelenik, M., 748
Zeppezauer, E., 35, 36, 44
Zerner, B., 372
Zerner, M., 44
Zewe, V., 293
Zimmering, P. E., 504
Zimmerman, R. A., 123
Zimmerman, S. B., 46, 194
Zinder, N. D., 427, 777, 780
Zink, M. W., 274
Zipser, D., 426
Zissmann, E., 688, 689
Zito, R., 394
Zobel, C. R., 532, 533
Zonta, L. A., 499, 501, 762, 769
Zottu, S., 260, 293
Zubay, G., 113, 418
Zuckerkandl, E., 729, 741, 747, 750, 755, 757, 758, 774, 778, 779, 780
Zuckerman, H., 21
Zuidweg, M. H. J., 676
Zwenk, H., 180, 184

# SUBJECT INDEX

A

Acetate
  biosynthesis of
    and aquocobamides, 243, 244
    in a cell free system, 243
    from $CO_2$, 243-45
    cobalamin role, 243-45
    and ferredoxin, 244
    and methyltetrahydrofolate, 243, 244
    requirements of, 243, 244
Acetyl choline
  cyclic AMP effect on, 150
Acetylene
  and nitrogenase, 334, 335, 348
Acidosis
  and cyclic AMP, 161
  and lipolysis, 161
Acrasin
  identity with cyclic AMP, 169
Acridine dyes
  and energy transfer with DNA, 589-91
  as mutagens, 588, 589
Acrylonitrile
  reaction of, with proteins, 709
Actin
  F-actin
    and myosin, 529
    and nucleotides, 528, 529
  G-actin
    molecular weight of, 528
    and nucleotide binding, 528, 529
    and proptoplasmic streaming, 539
    shape of, 528
    terminal peptide of, 528
    viscosity of, 528
  G-F transformation of, 528, 529
  and myofilament structure, 536, 537
Actinins, 527, 528
Actinomycin
  and cytodifferentiation, 645, 646
  and RNA biosynthesis, 645, 646
Activating enzymes
  amino acyl transfer RNA synthetases
    recognition site in transfer RNA, 145, 146
    specificity site in transfer RNA, 144, 145
  see also Amino acyl transfer RNA synthetases
Active sites
  and autosteric effectors, 362
  in carboxypeptidase, 33, 34, 367, 368
  in chymotrypsin, 28-30, 42, 43, 367
  in crystalline proteins, 45
  definition of, 360, 361
  in lysozyme, 42, 43, 363, 364
  in ribonuclease, 31-33, 43, 365, 366
Acylation
  of lysine, 701-3
  of proteins
    by acid anhydrides, 698, 699
    and amidination, 702, 703
    and cyanate, 701
    with ethyltrifluoroacetate, 699, 700
    and guanidination, 701, 702
    mechanism of, 698
    reversible, 699, 700
    with succinic anhydride, 699
    and sulfonation, 703, 704
    with trifluoroacetic anhyride, 699, 700
  of tyrosine, 700
Acyl carrier protein
  and glycerophosphate acylation, 305
  and 4'-phosphopantetheine, 304-6
  soluble, in plants, 306
Adenosine monophosphate
  and adenylate deaminase, 214-16

and fructose diphosphatase, effect on, 257
in glutamine synthetase, 81, 82
see also Cyclic AMP
Adenosine 3',5'-monophosphate see Cyclic AMP
Adenosine triphosphate
and adenylyl transferase of E. coli, 81, 82
and bioluminescence, 603, 604
and carbamyl phosphate synthesis, 202
and control mechanisms
in gluconeogenesis, 272, 273, 284, 285
in glycolysis, 271, 272, 281, 284, 285
and methane formation, 241-43
and nitrogen fixation, 333, 340-42
and polynucleotide ligase activity, 195
S-Adenosyl methionine
and cyclopropane fatty acids, 323
and homocysteine methylation, 90-92, 236-40
and lecithin biosynthesis, 308, 309
Adenyl cyclase
assay of, 168, 169
cyclic AMP formation, 149-58
fluoride, effect on, 152
glucagon, effect on, 153
as hormone receptor, 151, 152
mammalian
as component of cell membrane, 152
purification of, 152
molecular configuration of, 151
pyruvate effect on, 153
as signal discriminator, 151
as signal generator, 151
soluble, from bacteria, 153
Adenylate deaminase
control of
and alkali metal cations, 214-16
and allosteric effects, 215, 216
by feedback, 214, 215
and nucleotides, 214-16
kinetics of, 215
models of, 215
Adipose tissue
cyclic AMP formation in, 160
and pentose phosphate cycle, 263
Adrenergic blocking agents
and insulin release, 166
lipolysis, effect on, 159, 160
muscle, effect in, 156
salivary glands, effect in, 165
Adrenocorticotropic hormone
cyclic AMP effect on, 150
insulin-releasing effect of, 166
lipolytic effect of, 158
steroidogenic effect of, 162
Adrenodoxin
and adrenodoxin reductase, 673
FAD in, 673
and NADPH, 673, 674
oxygen binding by, 673
physical properties, 673
and steroid hydroxylation, 673, 674
Agarose
and gel filtration, 16, 17
and zone electrophoresis, 14
Albertsson, P. A., 15
Alcohol dehydrogenase
crystallographic studies of, 36
fractions of, 666
and hydroxysteroid dehydrogenase, 667
isolation of, 666, 667
properties of, 35, 36
substrates of
diamond lattice approach, 661, 662
NAD role, 666
steroids, 666
Aldolase
and conformational changes, 381
as rate-limiting step in gluconeogenesis, 257, 259
Alkaline phosphatase
control of, 424
subunits of, 396
Alkylating agents
reactions of
with bases, 178, 179
with DNA, 178, 179
ethyl ethane sulfonate, 178
methyl methane sulfonate, 178
nitrogen mustards, 178
sulfur mustards, 178
Alkylation
of carboxyl groups in proteins, 715, 716
of proteins
with benzyl halides, 707
of carboxyl groups, 708
with $\alpha$-haloacids, 709
mechanism of, 706
with sulfenyl halides, 707, 708
N-Alkylmaleimides
reaction of, with proteins, 708, 709
Allosteric effects
and adenylate deaminase, 215, 216
allosteric sites
definition of, 361, 362, 389, 390
and aspartate transcarbamylase
catalytic subunit, 204, 390, 391
and conformational changes, 391
regulatory subunit, 204, 390, 391
definition of, 361, 362
and deoxycytidylate deaminase, 217-19
and enzyme evolution, 402-5
and enzyme flexibility, 389, 390
and firefly luciferase, 607
and glutamine synthetase, 391, 392
and hexokinase, 292, 293
models of
applications of, 398
and association-dissociation phenomena, 400
and conformational changes, 361, 396-99
and induced-fit theory, 396-98
and kinetic constants, 400
and protein design, 399
sequential changes in, 396-99
and symmetry principle, 396, 398, 399
and multienzyme complexes, 392, 393
and nucleotide biosynthesis, 201-3, 205-7, 209, 213, 215, 217, 218
and purine biosynthesis, 205
and ribonucleoside diphosphate reductase, 392
and ribonucleotide reductase, 235, 236
and subunit structure, 390, 391, 402
and thymidine kinase, 213
Amber mutations
in bacteriophage $\lambda$ DNA
and mismatched base

pairs, 183
Amber suppressor transfer RNA structure, 131-36, 145
see also Suppressors
Amino acyl transfer RNA synthetases
and histidine biosynthesis control, 422
and repression, 422
and transfer RNA structure
recognition site in transfer RNA, 145, 146
specificity site in transfer RNA, 144, 145
see also Activating enzymes
Amylase
secretion of
cyclic AMP role in, 151, 165
Angiotensin
cyclic AMP effect on, 150
Antibodies
allotypic variation in, 501
amino acid sequences of
and allotypic variation, 501
and antibody specificity, 503, 506, 507, 515
and charge heterogeneity, 502
determination of, 516, 517
in heavy chains, 499, 501, 502
and heterogeneity, 499, 501-3, 506, 507
in light chains, 499, 501, 502, 507
combining site of
and affinity labeling, 515
and charge, 506
and conformation, 507, 515, 516
labeling of, 515, 516
and polymeric antigens, 503, 504, 507, 508
and sequence studies, 499, 515
size of, 503, 504, 507
and specificity, 507, 515
and subclasses, 500, 501
heterogeneity of
and allotypic variation, 501, 505
and Bence-Jones proteins, 498
and charge, 502, 505, 506
and conformation, 507, 509, 510
and electrophoretic methods, 502
and functional properties, 503, 504, 507-10, 515
and idiotypic variation, 501, 502
and immunogens, 497, 498
and isotypic variation, 499-501, 505
limitations upon, 505-8
and sequence studies, 498, 499, 501-3, 506, 507
and structural studies, 497-99, 507
homogeneous
and affinity labeling, 515, 516
and antigenic stimulus, 511, 512
and clone dominance, 512
and clone propagation, 511
crystalline, 512
and macroglobulins, 513, 514
and myeloma proteins, 512-14
production techniques, 511
from a single cell, 511
idiotypic variation in, 501, 502
isotypic variation in, 499-501, 505
misdirected
and lymphoproliferative disorders, 514
and polymeric antigens, 503, 504
structure of
classes of, 499, 500
heavy chains, 499-502
light chains, 499-502, 505, 513, 514
see also Immunoglobulins
Arabinose
control of catabolism of
and enzyme induction, 418
and gene order, 418
and positive control, 418, 419
Arginine
reaction of, in proteins, 712-14
Arylation
of proteins
with fluorodinitrobenzene, 704, 705
with trinitrobenzenesulfonic acid, 705
Aryl halides
reactions of, with proteins, 704-6
Aspartate semialdehyde dehydrogenases
properties of, 86
Aspartate transcarbamylase
in animal cells
control of, 204
in E. coli
conformational changes in, 390, 391
control of, 204, 390
and CTP, 204, 390
subunits of, 204, 390, 391
Aspartic acid
and aspartate transcarbamylase, 204, 390, 391
and aspartokinases, 84-88
as a precursor of amino acids, 84
Aspartokinases
aspartokinase I, of E. coli
and homoserine dehydrogenase I, 86-88
mutations in, 87, 88
aspartokinase II, of E. coli
and homoserine dehydrogenase II, 88
methionine repression of, 88
aspartokinase III, of E. coli
and homoserine dehydrogenase, 86-88
inhibition of, 85
molecular weight of, 85
of E. coli, 84-88
of R. spheroides, 86
variety of, 84
Avidin
circular dichroism of, 451
Azide
and nitrogenase, 334, 335, 348
Azobacter vinelandii
nitrogen fixation in
in cell free systems, 333-35
and nitrogenase, purification of, 338, 339
and nitrous oxide, 347, 348
paramagnetic proteins in, 337

B

Bacillus cereus
energy metabolism in
and Embden-Meyerhof pathway, 64
exosporial fragments of
composition of, 55
glutamine synthetase in, 83, 84
RNA of
terminal nucleotides of, 110, 111, 142
spores of
DNA in, 57
enzymes of, 60-62
protein synthesis in, 64

sporulation of
and protein synthesis, 70
Bacillus megaterium
spores of
enzymes in, 62
nucleic acids in, 57, 62
phospholipids in, 55
proteins in, 56, 57
proteins synthesis in, 63, 64
pyrophosphatase in, 61
sporulation in
and protein synthesis, 70
Bacillus subtilis
aromatic amino acid biosynthesis in, 97-100, 393
glutamine synthetase in, 83, 84
proteases in
X-ray crystallography of, 35
RNA of
terminal nucleotides of, 110, 111, 142
spores of
enzymes of, 62
nucleic acids in, 57, 63
protein synthesis in, 63, 64
sporulation of
facilitation of, 52
genetic implications of, 52
inhibition of, 52
and protein synthesis, 68-70
and protein turnover, 71
Bacillus thuringiensis
sporulation of
and protein synthesis, 68
and protein turnover, 71
Bacteriochlorophyll
crystallization of, 36
Bacteriophage f2
optical rotatory dispersion of, 444
RNA of
terminal nucleotides of, 141, 143
Bacteriophage λ
DNA of
cohesive ends of, 194
conversion to circular form, 194
excision of pyrimidine dimers in, 181
with mismatched bases, 183
recombinant molecules of, 190
strand breakage in, 177
and exonuclease level, 187
and lysogeny
in recombination deficient cells, 187
β protein level, 187
Bacteriophage M13
DNA of
replication of, 191
Bacteriophage MS2
optical rotatory dispersion of, 444
RNA of
terminal nucleotides of, 143
Bacteriophage φX-174
DNA of
infective, in vitro synthesis of, 195, 196
replication of, 191
strand breakage, 177
optical rotatory dispersion of, 444
Bacteriophage Qβ
RNA of
terminal nucleotides of, 143
Bacteriophage S13
DNA of
replication of, 191
strand breakage in, 177
Bacteriophage T2
DNA of
folding of, in virus, 444
optical rotatory dispersion of, 444
ultraviolet irradiation of, 181
optical rotatory dispersion of, 459
Bacteriophage T4
DNA of
excision of pyrimidine dimers in, 181
recombinant molecules of, 190
recombination of, 183
ultraviolet irradiation of, 181
multiplicity reactivation of, 183
and polynucleotide ligase, 194
Bacteriophage T7
DNA of
strand breakage in, 177
Bence-Jones proteins
as antibodies, 498, 499
peptides of
amino acid sequences, 516
invariant positions in, 516
sequential degradation of, 516, 517
Bennich, H.
and serum fractionation, 13
Benzyl halides
reactions of, with proteins
mechanism, 707
tryptophan residues, 707
Bioluminescence
of Chaetopterus, 623, 624
of Euphasid shrimp
mechanism of, 623
and oxygen, 623
protein of, 623
function of
and active oxygen, 624-26
in bacteria, 624
as detoxification mechanisms, 624
mechanisms of, 626
of jellyfish
and aequorin, 621, 622
and calcium, 621, 622
energy source, 622, 623
and NAD, 621, 622
and phytoprotein, 621, 622
and precharged protein, 621
mechanisms of
and chemiluminescence, 598-600
classification of, 597
enzyme role, 597, 598
peroxidation, 618, 619
in precharged systems, 619-24
and quantum yields, 598
reduction and oxidation, 610-18
substrate activation and oxidation, 602-10
substrate oxidation, 600-3
turnover, 597, 598
and peroxidases, 618
by peroxidation, 618, 619
photochemical induction of
and chemically induced luminescence, 614, 615
and delayed light emission, 615
efficiency of, 615
and flavins, 615
and oxygen, 615
in precharged systems
of Chaetopterus, 623, 624
and control mechanisms, 619
dinoflagellates, 619
of jellyfish, 621-23
of scintillons, 617, 619-21
of shrimp, 623
soluble systems, 619, 620
by reduction and oxidation

aldehyde role, 612-14
in bacteria, 610-13
enzyme intermediate lifetime, 612
FMN role, 610, 611, 614
in fungi, 617, 618
NAD effect, 610
in particulate structures, 617, 618
and photochemical induction, 614, 615
reaction steps, 610-12, 617-18
by substrate activation and oxidation
ATP role, 603, 604, 606, 607
color of luminescence, 605, 606
and conformational changes, 607
control of, 607-10
in firefly, 603-8
luciferase, 603-5, 608, 609
luciferin, 603, 604, 609, 610
mechanism, 603, 604, 606-8
and oxygen consumption, 606, 609
product of reaction, 606, 607, 609
in Renilla, 608-10
by substrate oxidation
in Cypridina, 600-2
in fish, 602
in Latia, 603
and luciferase, 600-2
and luciferin, 600, 601
mechanism of, 600
in Odontosyllis, 602, 603
Boman, H.
and Tiselius, 13
Bovine serum albumin
circular dichroism of, 451
Brevibacterium liquefaciens
formation of cyclic AMP in, 153

C

Carbamylation
of proteins, 701
Carbamyl phosphate
biosynthesis of
activation of synthetase, 203
amino donor for, 202
and arginine biosynthesis, 203
ATP role, 202
feedback inhibition of, 203
intermediates in, 202
repression of synthetase, 203
as orotate precursor
in animal tissues, 203
Carbon disulfide
reaction of, with proteins, 700, 701
Carbonic anhydrase
inhibition of
by sulfonamides, 34
optical rotatory dispersion of, 448, 449, 451
properties of, 26
structure of
binding of sulfonamides, 34
α-helix in, 34, 39
zinc in, 34, 43
Carboxypeptidase
activity in crystalline state, 44
and diazonium salts, reaction with, 710, 711
mechanism of catalysis in, 34
properties of, 26
structure of
active site in, 33, 367, 368
changes in, upon substrate binding, 33, 34, 41
α-helix in, 33, 39
model of, 32, 33
zinc in active site of, 33
Cardiolipin
biosynthesis of, 310, 313
and malate dehydrogenase activation, 471
structure of, 312, 313
Catalytic power
definition of, 360
and enzyme structure, 374, 401
theoretical considerations, 370-80
Catecholamines
cyclic AMP effect on, 150
and cyclic AMP formation, 152, 153
hyperglycemic response to, 161
inotropic effect
cyclic AMP mediation in, 156
insulin-releasing effect of, 166
lipolytic effect of, 158
in salivary glands, effect, 165
in toad bladder, effect, 164
Chemiluminescence
and bioluminescence, 599, 600, 623
and excited molecular pairs, 599
and excited states, 599
and FMN, 610
and oxygen absorption studies, 599
theories of, 599
Chloramphenicol
and ribosome formation, 116, 117
and sporulation, 73
Chlorodinitrobenzene
reaction of, with proteins, 705
Cholesterol
and lysolecithin formation, 320, 321
metabolism of
and cyclic AMP, 162, 163
hormone effects on, 162, 163
side-chain cleavage of
by adrenal enzymes, 677, 678
and androgen synthesis, 679
intermediates in, 677-79
mechanism of, 679, 680
and NADPH, 678, 679
oxidative, 678, 679
and pregnenolone synthesis, 678, 679
and progesterone synthesis, 678, 679
specificity of, 677, 678
and steroid hormone biosynthesis
pathway of, 677, 678
Chromatin
and DNA transcription, 646, 647
states of, 646, 647
Chromatography
historical development of, 9, 10, 15-17
Chymotrypsin
activity in crystalline state, 44
acyl enzyme intermediate of, 373
circular dichroism of, 451
conformation of
and active site, 28-30, 40, 43, 46, 367
changes in, upon activation, 367
crystal structure, effect on, 39, 40
diagram of, 28, 29
α-helix in, 28, 39, 367
hydrophobic interactions in, 28
and iodination of tyrosine, 45
and pH titration, 46

pleated-sheet structure in, 28
polar groups in, 28
sulfonylation effect on, 40
formation from chymotrypsinogen, 27, 29, 30, 41
isomorphous derivatives of, 28
properties of, 26
reaction of
with benzyl halides, 707
with diazonium salts, 710, 711
with fluorodinitrobenzene, 704, 705
Chymotrypsinogen
activation of
crystallographic evidence, 27
and peptide bond cleavage, 27, 29
structural changes during, 27, 28, 41
circular dichroism of, 451
conformation of
similarity to π-, δ-, and γ-chymotrypsins, 30
properties of, 26
reaction of
with fluorodinitrobenzene, 704, 705
Cilia
and ATP, 523-25
and ATPase
in axonemes, 523, 524
in membrane fractions, 523
axonemal proteins of
dynein, 523, 524
fiber proteins, 524
and dynein
ATPase activity of, 524, 525
filaments of, 523, 524
localization of, 523, 524
sedimentation of, 523, 524
fractionation of, 523
phosphatase of, 525
phosphotransferase of, 523, 525
Circular dichroism
calculations of, 442, 443
and conservative spectra, 441
of heme proteins
and α-helix content, 452, 453
and heme binding, 452, 453
and heme environment, 452
of membranes, 474, 475
and nonconservative spectra, 441
of nucleic acids
and base tilting, 441, 443
and conformation, 441, 442
DNA, 441
homopolyribonucleotides, 441
RNA, 441
rotational strengths, 441, 442
of polypeptides
and α-helix, 445
and β structure, 446
of polysaccharides, 454, 455
of proteins
and aromatic residues, 449-52
and disulfides, 449, 451
heme proteins, 452, 453
oxytocin, 449
ribonuclease, 449-51
and side-chain chromophores, 449-52
Claesson, S.
and physical measurements, 3, 10
Clostridium pasteurianum
ferridoxin in, 336
flavodoxin in, 336
nitrogen fixation in
cell free system of, 332, 334, 335
purification of nitrogenase from, 338, 339
paramagnetic proteins in, 337
Coenzyme A
and fatty acid synthetase, 305, 306
and glyceride acylation, 304-6
and phosphatidic acid biosynthesis, 304, 305
and phospholipid acylation, 321, 322
Collagen
cross-linking of
and aldehyde groups, 549-55, 564-67
and β-aminopropionitrile, 563, 564
biosynthetic sequence of, 552, 553, 565-67
and degradation during extraction, 556
inhibition of, 563-67
intermolecular, 553, 554, 567
and lathyrism, 553, 556, 557, 563, 564
location of, in molecule, 550, 551, 553, 554
lysine derivation of, 550-53, 555, 564
nature of, 550, 552, 553, 556, 566, 567
and penicillamine, 565, 566
potential bonds, 548, 549, 555
and Schiff's base formation, 553, 554, 566
defective, 563-67
distribution of, 547
fibrils of
and cross-links, 557
formation of, 547, 548, 557, 566
function of, 547
monomer unit of, 547, 548
peptides of
and cross-links, 550-53
by cyanogen bromide cleavage, 550-52
formation of, 550
sequences of, 551
terminal amino acids of, 551, 552
reconstitution of, 554, 566
shape of, 550
Complementation
and lactose control, 415, 416
Conformation of proteins
see Protein structure
Conformational changes in enzyme action
and allosteric effects, 389-400
and firefly luciferase, 607
and induced-fit theory
and aldolase, 381
and carboxypeptidase, 382, 388, 389
and creatine kinase, 381
and cytochrome c, 381, 382
and the enzyme-substrate complex, 380, 381, 387, 389, 397, 403
and hemoglobin, 381, 382, 389
and hexokinase, 384
and isoleucyl transfer RNA synthetase, 384, 385
and ligand-protein interactions, 381, 387, 397, 403
and ligand size, 381, 382
and lysozyme, 382, 383, 388, 389
and noncatalytic molecules, 383, 384
and polymeric substrates, 388, 389
quantity of change, 382
in relation to template theory, 380

and ribonuclease, 382, 383
and substrate conformation, 388
and thiol subtilisin, 382
and two-ligand reactions, 385
water role, 384, 385
inhibition of, 385, 386
mechanism of induction of, 386, 388
rate of, 389
and the template hypothesis, 380
universality of, 382, 383
and X-ray crystallographic studies, 39, 41
Conjugation
DNA transfer in
and DNA replication, 188
pyrimidine dimer effect on, 188
Corrinoids
and acetate biosynthesis
and aquocobamide, 243, 244
from carbon dioxide, 243-45
in cell free system, 243
cobalamin role, 243-45
and ferredoxin, 244
and methyltetrahydrofolate, 243, 244
requirements of, 243, 244
and dioldehydrase
binding sites of, 229, 230
carbon-cobalt linkage in, 228, 229, 231
and cobalamins, 228-31
cobalt oxidation state in, 229
coenzyme of, 228, 229
as hydrogen transfer agent, 230, 231
and p-hydroxymercuribenzoate, 228
inactivation of, 228, 229
inhibition of, 228
light sensitivity of, 228, 229
mechanism of reaction, 229-31
reactions of, 226, 228-31
and ribonucleotide reductase, 234
spectrum of, 228, 229
enzymatic reactions of
and aquocorrinoids, 225, 236-45
and Co-5'-deoxyadenosylcorrinoid, 225-36
and ethanolamine deaminase
cobalamin effect, 231, 232
reaction mechanism of, 232
reactions of, 226, 231, 232
spectrum of, 231, 232
and glutamate mutase
cobalamin binding by, 226, 227
components of, 226, 227
molecular weight of, 226
stereospecificity of, 227
sulfhydryl groups of, 227
and glycerol dehydrase
and cobalamins, 231
and cobamide determinations, 231
molecular weight of, 231
reactions of, 226, 231
and homocysteine methylation
and aquocobalamin, 237, 238, 240
cobalt role, 237-41
cyanocobalamin effect, 236, 237
and 5'-deoxyadenosylcobalamin, 237
and methyl cobalamin, 237
methyltetrahydrofolate role in, 236-41
propylation of transmethylase, 237-41
S-adenosylmethionine role in, 236, 238-40
spectral data, 237-39
and β-lysine isomerase
cofactors of, 232, 233
metabolic role of, 232, 233
reaction mechanism of, 232, 233
and methane formation
and aquocobamide, 242, 243
ATP role, 241-43
carbon sources, 241, 242
and methylcobalamin, 241, 242
methyl donors in, 242
and methyltetrahydrofolate, 241-43
and methylmalonyl CoA-mutase
reactions of, 226, 227
stereospecificity of, 227, 228
and ribonucleotide reductase
allosteric effects in, 235, 236
and 5'-deoxyadenosylcobalamin anilide, 233
5'-deoxyadenosylcobalamin role, 234-36
and dihydrolipoate, 233, 236
and dioldehydrase, 234
and hydrogen transfer, 234
mechanism of reaction, 234-36
purification of, 236
reactions of, 233
reductants of, 233
substrates of, 233
and thioredoxin, 233, 234, 236
and thioredoxin reductase, 233, 234
Corticosteroids
and gluconeogenesis, 287, 288
Creatine kinase
and conformational changes upon substrate binding, 381
Crossover theorem
and glycolysis control, 280, 281
and metabolic control, 275-77
Crystalline proteins
activity of
methods of study, 44-46
reaction rates, 45
antibody as, 512
and conformational change, 45
reactivity of crystals, 45
structure of, in solution, 44-46
see also individual proteins
Cyanate
reaction of, with proteins, 701
Cyanide
and nitrogenase, 334, 335, 348, 349
Cyanocobalamin
and homocysteine methylation, 236, 237
and ribonucleotide reductase, 210
Cyanuric acid
reaction of, with proteins, 700
Cyclic AMP
acrasin, identity with, 169
and adenyl cyclase, 151-53
adrenergic blocking agent effect on, 156
and adrenergic α-receptors, 164
and amylase secretion, 151, 165, 166
and antidiuretic effects, 164
assay of, 168, 169

derivatives of
potency of, 168
synthesis of, 168
and diuretic effects, 164
and enzyme activities, effect on, 151, 154, 155, 167
excretion of, 164, 165
formation of, in E. coli, 153
and gluconeogenesis, 289, 290
and glycogen metabolism, 274
and glycogen synthetase, 151, 167
and hormones, effect on, 149-69
and inotropic response, 156, 157
and insulin
release of, from pancreas, 151, 165, 166
level of
in heart, 156
and lipolysis, 151, 158-61
and permeability, 151, 164
and phosphodiesterase, 149, 150
and phosphorylase activation, effect on, 151, 155
and salivary glands, 165
as second messenger, 149, 162
in smooth muscle, effect of, 157, 158
and steroidogenesis, 151, 162, 163
and theophylline
diuretic effect of, 164
and hormone potentiation, 156
in unicellular organisms, 153, 169
and vasopressin
and antidiuretic effect, 163, 164
Cyclopropane fatty acids
environment, effect on formation, 324
mechanism of formation, 323, 324
precursors of, 323
and S-adenosyl methionine, 323
Cypridina hilgendorfii
bioluminescence in
luciferase of, 600
mechanism of, 600
Cytochrome c
acylation of
reversible, 699, 700
conformational changes in, 381, 382
and diazonium salts, reaction with, 710, 711
distribution of, 736
evolution of
ancestral forms, 742-44
and conformation, 729
and conservative substitutions, 737, 738
constant characteristics in, 737, 738
and deletions, 734, 735, 737
factors influencing, 729
and function, 738-41
and invariant residues in, 733, 734, 736-38, 740, 744-46
unit evolutionary period, 739-42
guanidination of, 702
optical rotatory dispersion of, 448, 449
structure of
ancestral forms, 743, 744
and chain termini, 737, 776, 777
and function, 738, 739, 744-46
α-helix in, 35, 39
heme group in, 35
hydrophobic center of, 34, 35
and phylogeny, 739, 742-44
and point mutations, 772, 773
in solution, 44, 45
in various organisms, 35, 736, 737
by X-ray crystallography, 26, 34, 35, 744, 745
X-ray crystallography of, 26, 34, 35, 744, 745
Cytochrome oxidase
lipid requirements of, 470, 471
Cytochrome P-450
derivatives of, 673
and steroid hydroxylation, 672-75

D

Dehydrogenases
alcohol dehydrogenase
activity of, on steroids, 666, 667
aspartate semialdehyde dehydrogenase, 86
and C-1,2-dehydrogenation of steriods, 671, 672
glyceraldehyde-3-phosphate dehydrogenase
activity in crystalline state, 44
conformation of, and DPN binding, 394, 395
maximal capacity of, in various tissues, 258, 259
of rabbit muscle, 395
X-ray crystallography of, 35, 36
of yeast, 394, 395
hydroxysteriod dehydrogenase
compared to alcohol dehydrogenase, 666, 667
specificity of, 661-66, 681
X-ray studies of
comparison of, 35, 36
and subunit structure, 35, 36
5'-Deoxyadenosylcobalamin
and homocysteine methylation, 237
and ribonucleotide reductase, 208, 209, 234-36
Deoxycytidylate deaminase
aggregation of, 217, 219
conformation of, 217
control of
activation of, 216-18
and allosteric effects, 217-19
inhibition of, 216-19
magnesium effect, 216, 217
and subunit structures, 218
synthesis of, 219
induced by bacteriophage, 219
kinetics of, 216-18
molecular weight of, 217, 219
specificity of, 216
subunits of, 218
Deoxyribonucleic acid (DNA)
and acridine dyes
and energy transfer, 588-91
as mutagens, 588, 589
in bacterial spores, 56, 57
as chromatin complex, 646
degradation of
in recombination deficient mutants, 186, 187
after single-strand breakage, 181, 182
energy transfer in
and acridine dyes, 588-91, 593
5-bromouracil effect, 592
and double-stranded structures, 591, 592
singlet energy transfer, 582, 583
triplet energy transfer, 583-86
optical rotatory dispersion of

and folding, in viruses, 444, 445
repair of, see DNA repair
replication of, see DNA replication
structural damage to, see DNA structural damage
synthesis of, see DNA synthesis
thymine dimer formation in
and DNA replication, 187, 188
and DNA transfer, 188, 189
and energy transfer, 588
and thymine content, 592
transcription of
regulation of, 146
repair of, 180-82
see also individual organisms
DNA phosphatase
in recombination deficient E. coli, 186
DNA polymerase
in Bacillus sp. spores, 62
exonuclease II association with, 192
infectious DNA synthesis with, 195, 196
and initiation of replication, 193
mechanism of action of, 191, 193
and pyrimidine dimers, 188
in recombination deficient E. coli, 186
DNA repair
enzymes involved in, 191-96
of mismatched bases, 183
physiological role of, 190, 191
after ultraviolet irradiation
and degradation of DNA, 182
excision enzymes, 181, 182
pyrimidine dimer excision, 181
single-strand rejoining, 182, 185
DNA replication
asynchronous, 638
and cytoplasmic DNA, 639, 640
and embryonic development, 637-41
and endoreproduction, 640
initiation of, 479, 638, 639
in interphase, 638
in particulate fraction of cell, 479, 480
and pyrimidine dimers
and discontinuities, 189
effect on conjugation, 188
in excision defective E. coli, 187
molecular weight of product, 187, 188
and strand exchange, 189
role of strand joining enzymes, 191
of single-stranded DNA, 191
DNA structural damage
by alkylating agents, 178, 179
by chemical mutagens, 176
interstrand cross-link excision, 181
repair of, 175-96
and single-stranded DNA, 177, 181, 182
and ultraviolet irradiation
dimer excision, 180
photoproducts of, 177
and ultraviolet sensitive mutants, 179
by X-rays, 177
DNA synthesis
of infectious DNA, 195, 196
inhibition of, 210, 211
strand joining enzymes, role of, 191
after ultraviolet irradiation in excision deficient bacteria, 187
Desmosine
biosynthesis of, 558, 559
in elastin, 558, 559
Dextran
Macrodex, 10, 11
Difference Fourier studies
of carbonic anhydrase, 41
of carboxypeptidase, 41
of chymotrypsin, 40
of hemoglobin, 41, 42
of lysozyme, 40, 41
of myoglobin, 40, 41, 43
of ribonuclease, 41
Differentiation
and adult cells
and cytodifferentiation, 635, 636
definition of, 635
and control mechanisms
and DNA transcription, 641-48
levels of, 636, 637
relevance of, 632, 633
cytodifferentiation
and actinomycin sensitive steps, 645, 646
and RNA synthesis, 645, 646
definition of, 632-36
and determination, 634
and DNA replication
in cytoplasm, 639, 640
cytoplasmic control of, 638, 639
in embryo development, 637-41
and gene content, 640
during interphase, 638
in microsporocyte meiosis, 638
and DNA, transcription of
in embryonic systems, 641-44
and ribosomal RNA synthesis, 648-51
timing of, 641
and morphogenesis
control of, 634, 635
definition of, 634
and RNA translation
control of, 652
in Dictyostelium, 654
and hormones, 652-54
insulin effect, 652, 653
and messenger stability, 651
in neural retina, 653
RNA varieties synthesized, 642
in slime mold, 654
Diffusion
in zeolite crystals, 5, 6
Diglycerides
and lecithin synthesis, 309, 310
Dihydrodipicolinate
biosynthesis of, 88, 89
Dinucleotides
base stacking in, 580, 581
energy transfer in
and absorption spectra, 580
and fluorescence, 580
and phosphorescence, 580, 581
Dioldehydrase
carbon-cobalt linkage in, 228, 229, 231
and cobalamins, 228-31
coenzyme of
nature of, 228
spectrum of, 228, 229
as hydrogen transfer agent, 230, 231
inhibition of, 228
light sensitivity of, 228, 229
mechanism of reaction, 229-31
reactions of, 226, 228-31
and ribonucleotide reductase, 234

Diol lipids, 318, 324
Diphosphopyridine nucleotide ($DPN^+$)
  and glyceraldehyde-3-phosphate dehydrogenase
    and negative homotropic effect, 395
    in rabbit muscle, 395
    in yeast, 394, 395
  and polynucleotide ligase action, 194
  see also $NAD^+$
Dipicolinic acid
  biosynthesis of, 89
Dynein
  ATPase of
    activity of, 525
    cation requirements, 524
  localization of, 523, 524
  sedimentation of, 523, 524
  sources of, 523, 524
  and spermosin, 524

E

Elastin
  cross-linking in
    biosynthetic pathway of, 558-61, 566, 567
    and copper deficiency, 565
    and desmosine, 558, 560, 561
    inhibition of, 565-67
    and isodesmosine, 558, 560, 561
    and lathyrism, 565
    lysine derivation of, 558, 560, 561
    nature of, 558-63
    quantity of, 559, 562
    and Schiff's bases, 558, 559
  distribution of, 547
  elasticity of, 548
  function of, 547
  precursor of
    and fiber formation, 562
    models of, 562
  preparation of, 557, 558
  structure of
    and collagen structure, 562, 563
    and denaturation, 562
    models of, 562
Electron paramagnetic resonance
  paramagnetic proteins and nitrogenase, 337
Electrophoresis
  early work, 4, 5
  on gels
    early work, 8
    media used, 14
  on paper, 8
  of serum, 6, 8
Embryos
  cell cycle time in, 638
  and DNA, transcription of
    control of, 646-48
    patterns of, 643, 644
    RNA varieties synthesized, 642
    timing of, 641, 642
  development of
    and DNA, 637-41, 643
    and protein, 637
    and RNA, 637, 641-48
  and RNA biosynthesis
    in oocytes, 644, 645
    patterns of, 643, 644
    in sea urchin embryos, 643, 644
    timing of, 641, 642
    varieties of, 642
  and RNA processing, 651
  and RNA translation
    maternal RNA, 651, 652
    in neural retina, 653
Endoreproduction
  and DNA replication, 640
  and extrachromosomal nucleoli, 640
Energy transfer
  in biological systems, 571, 572
  in bioluminescence, 598-600, 606, 614, 615, 623
  and coupling between chromophores
    quenching by paramagnetic ions, 578, 579
    and separation, 576
    and singlet-singlet transfer, 576, 577
    and triplet-singlet transfer, 577, 578
    and triplet-triplet transfer, 577
  in dinucleotides, 580, 581
  in DNA
    and adenosine content, 583, 584
    and bound dyes, 584
    and excited state dimers, 582
    and fluorescence, 575, 582, 585
    and metal ions, 585
    and mutations, 572
    and phosphorescence, 575, 583, 585
    and quenching, 582-86
    and thymine dimer formation, 572
  at low temperature
    in dinucleotides, 580, 581
    in DNA, 582-86
    in poly dAT, 581, 582
    in polyriboadenylic acid, 586, 587
  in polynucleotides
    and excited state dimers, 575
    and fluorescence, 575
    long-range transfer, 582
    poly dAT, 581, 582
    polyriboadenylic acid, 586, 587
    quenching by paramagnetic ions, 578, 579, 586
  at room temperature
    and acridine dyes, 588
    and DNA inactivation, 591-93
    and low-temperature studies, 587, 588
    and sensitised photoreactions, 588
Enzyme action, theories of
  and acid-base catalysis, 371, 372, 378, 379
  and catalytic power of enzymes, 378-80
  and chemical analogues, 370
  and covalent intermediates
    and catalytic power, 372, 373, 378, 379
    in nature, 372, 378
    and reaction pathways, 373
  and ion-pair effects, 377-79
  and microscopic environment effects, 377
  and nonenzymatic models, 370
  and orientation effects
    and catalytic site, 374, 375
    and substrates, 373-75, 378
  proximity effect
    and collision probabilities, 370, 371, 378, 379
    theoretical considerations, 370, 371
  rack and strain theories
    and orientation effects, 376
    rigid enzyme model, 374, 376
    and substrate distortion, 374-76
  and solvent effects, 376-78
Enzymes
  in bacterial spores, 58-62
  see also specific enzymes and processes
Epinephrine
  and cyclic AMP, role of,

154, 155
and cyclic AMP synthesis, 152
and gluconeogenesis, 291
hepatic effects of, 154, 155
insulin-releasing effect of, 166
and neuromuscular transmission
cyclic AMP effect, 156
theophylline effect, 156
see also Hormones
Ergosterol
biosynthesis of
and methionine, 686, 688, 689
pathway of, 687, 688
precursors of, 687, 688
Escherichia coli
adenyl transferase of, 81, 82
alkaline phosphatase of
control of, 424
arabinose catabolism in
control of, 418, 419
arginine biosynthesis in
control of, 424
aspartate semialdehyde dehydrogenase of, 86
aspartate transcarbamylase of
control of, 390, 391
structure of, 390, 391
aspartokinases of, 84, 85
deoxyarabino-heptulosonate synthetase of, 97, 98
deoxycytidylate deaminase of, 219
DNA of
strand breakage in, 177, 180, 182
strand rejoining in, 180
enzymes of, see specific enzymes
excision defective strains of
chromosome transfer in, 188
formation of cyclic AMP in, 153
galactose catabolism in
control of, 419, 420
glutamine synthetase of, 80-84
homocysteine methylation in, 236-41
homoserine dehydrogenase of
control of, 392
lactose metabolism in
control of, 413-18
lipid metabolism in
and glyceride phosphokinase, 306
and phosphatidic acid, 305-7
and phosphatidyl glycerol, 311
membranes of
and carbohydrate uptake, 478, 479
isolation of, 464, 465
methionine biosynthesis in, 89-93, 236-41
nucleases of, 191-93
phenylalanine biosynthesis in, 97-100
phosphodiesterase of, 153
pyrimidine biosynthesis in, 202-5
ribonucleotide reductase of, 206-8
ribosomal protein of, 112, 113, 123-25
ribosomal RNA of
base composition of, 110, 111
biosynthesis of, 122, 123
molecular weight of, 109, 110, 125
terminal nucleotides of, 110, 111, 125, 142
5S ribosomal RNA of
primary structure of, 126, 137, 140, 141
secondary structure of, 137, 140
site in ribosome, 111
terminal nucleotides of, 111, 140, 141
ribosome formation in, 115-21
thymidine kinase of, 212, 213
transfer RNA of
structure of, 131-37, 144-46
tryptophan synthesis in
control of, 97, 98, 100-5, 423, 424
pathway of, 96-105
tryptophan synthetase of
control of, 103-5
reactions of, 103, 104, 393
structure of, 103, 104, 393
tyrosine biosynthesis in, 97-100
ultraviolet-sensitive mutants of, 179-86
Ethanolamine deaminase
cobalamin effect on, 231, 232
reaction mechanism of, 231, 232
reactions of, 226, 231, 232
spectrum of, 231, 232
Ether lipids
biosynthesis of, 315, 317
Evolution of proteins
and allosteric sites, 404, 405
and amino acid substitutions, 772, 773
and catalytic power, 401
and conformational changes, 401, 404, 405
convergent, 778-80
divergent, 778-80
and gene duplication, 777, 778
and hormones, 402
and microheterogeneity, 780, 781
molecular expression of, 772-81
operational mechanisms, 400, 401
and peptide subunits, 539, 540
and regulation, 402, 404, 405
and sequence deletions or additions, 773-77
and subunit structure, 402, 404, 405
Eyring, H.
and Tiselius, 5

F

Fatty acid synthetase
phosphopantetheine in, 305, 306
Ferredoxin
and acetate biosynthesis, 244
characteristics of, 334-37
and electron transport, 336
and nitrogen fixation, 334-37, 341-43
sources of, 336
structure of, 336, 337
Fibrinogen
conversion to fibrin
structural changes, 41
Fibrinopeptides
amino acid sequences of, 735
Firefly
luciferase of
ATP requirement, 603, 604
binding sites of, 607
and conformational changes, 607
control of, 607, 608
and luminescence color, 605, 606
and metals, 605
and N-ethylmaleimide reaction, 708, 709
physical properties, 604-6
sequence studies, 604, 605

luciferin of
analogues of, 604
ATP, reaction with, 603, 604
structure, 603, 605, 606
synthesis of, 604
Flagella
bacterial
and flagellin, 521, 522
and motility, 522
structure of, 522
of sperm
aggregation of, 525
and ATPase, 522, 523
energy requirements, 522, 523
enzymes of, 522, 523, 525
and guanine nucleotides, 524, 525
and motility, 522, 523
and spermosin, 524
turbidity of, 525
Flagellin
aggregation of, 522
molecular weight, 521, 522
preparation of, 521, 522
Flavin adenine dinucleotide (FAD)
as adrenodoxin component, 674
and steroid hydroxylation, 674-77
Flavin mononucleotide (FMN)
as bacterial luciferin, 610
and homocysteine transmethylase, 237-40
and methionine biosynthesis, 91
Flavodoxin
and nitrogen fixation, 334-37, 341, 342
Flodin, P.
and gel filtration, 16
Fluorescence spectroscopy of proteins
and tryptophan residue environment, 46
Fluoride
effect on adenyl cyclase, 152
Fluorodinitrobenzene
reaction of, with proteins, 704, 705

G

Galactose
control of catabolism of enzymes involved in, 419, 420
gene order in, 419, 420
β-Galactosidase
control of, see Lactose, control of
regulator of, see Lactose, lac regulator
β-Galactoside permease
control of, see Lactose, control of
regulator of, see Lactose, lac regulator
Gel filtration
and agarose, 16, 17
and calcium phosphate gels, 15
and dextrans, 16, 17
and hydroxyl apatite, 16
and polyacrylamide, 16, 17
Genetic reconstruction
recombination role in, 183-87
by sister exchange, 189
γ-Globulin
fragments of
crystalline form of, 36
Glucagon
and adenyl cyclase, effect on, 153
and cyclic AMP, effect of, 150, 154, 155
and cyclic AMP levels, 157, 289
and gluconeogenesis, 288-90
and heart muscle, effect on, 157
hepatic effects of, 154, 155
insulin-releasing effect of, 165, 166
lipolytic effect of, 158
and pyruvate carboxylase, 288, 289
see also Hormones
Gluconeogenesis
alternative pathways of, 252
and blood glucose levels, 264, 292-94
and blood lactate levels, 264
from 3-carbon precursors, 251, 267, 268
control mechanisms of
and actinomycin D, 285
and activation phenomena, 271
and adenine nucleotide ratios, 272-74, 284, 285
and adrenalectomy, 287
and converging pathways, 277
and corticosteroids, 287, 288
and diet, 269-72, 285, 286, 288, 289, 293, 294
and enzyme modification, 274
and fatty acids, 289-91
and feedback inhibition, 271, 292, 293
by hormones, 269-72, 274, 285-94
by induction of enzymes, 269
and intermediate pools, 276-78
and macromolecular interactions, 274, 275, 285
and maximal catalytic capacities, 269, 270, 272, 273
methods of investigation of, 275-78, 286
and pH, 273, 274
by physical separation, 284, 285
and rate-limiting steps, 275-77
by repression, 269
species differences in, 270, 271, 278
and substrate availability, 272-75
and the tricarboxylic acid cycle, 271-73
enzymes unique to, 255-57, 259, 270, 292, 296
and glucose efflux
and glucose-6-phosphatase, 260, 294, 295
regulation of, 294, 295
and subcellular localization, 295
and glucose:glucose-6-phosphate futile cycle
control of, 295, 296
and subcellular localization, 295, 296
and glucose-6-phosphate metabolism, 259, 261
and glucose uptake
allosteric effects in, 292, 293
in brain, 294
glucose transport role, 292-94
and hexokinase, 292-94
and pyrophosphate-glucose phosphotransferase, 293, 294
and regulation of blood glucose levels, 293, 294
and glycogen metabolism, 261
and intracellular enzyme localization
and control mechanisms, 265, 267, 268, 270
and cytosol, 265-67
and malate transport, 265-67
and mitochondria, 265-67

and pyruvate carboxylase, 267, 268
and pyruvate metabolism, 265-67
from lactate
cyclic AMP effect, 151, 154
maximal rate of enzymes of determination of, 253, 275, 296
and enzymes common to glycolysis, 257-59
enzymes unique to gluconeogenesis, 255-57, 269, 270, 285, 286, 296
precursor dependence, 255, 257
tissue dependence, 255, 257, 268, 270, 296
and other metabolic processes, 250-52, 284, 289-92
and oxalacetate, 251, 268
pathways of, 250-52, 265-67
and pentose phosphate cycle, 263
thermodynamic considerations, 252
tissue dependence of, 255, 257, 259, 263-68, 285, 286, 292-94, 296
Glucose-6-phosphate
and carbohydrate metabolism, role in, 251, 259
localization of formation of, 267, 268
metabolism of
and glucose-6-phosphatase, 260, 261
and hexokinase, 259-61
tissue dependence of, 259-61
Glutamate mutase
and cobalamin binding, 226, 227
components of, 226, 227
molecular weight of, 226, 227
stereospecificity of, 227
sulfhydryl groups of, 226, 227
Glutamine
biosynthesis of
in E. coli, 80-84
in other organisms, 83, 84
Glutamine synthetase
activity in crystalline state, 44
in E. coli
adenylated enzyme of, 81, 82
and adenylyltransferase, 81, 82
and feedback inhibition, 81
forms of, 81, 82
and inactivating enzyme of, 80, 81
molecular weight of, 80
production of, 81
regulation of, 82, 83
repression of, 80, 81
spectrum of, 81
subunits of, 80
in microorganisms, 83, 84
and neural retina, differentiation of, 653
Glyceraldehyde-3-phosphate dehydrogenase
conformation of, and DPN binding, 394, 395
maximal capacity of, in various tissues, 258, 259
properties of, 36
of rabbit muscle, 395
X-ray studies of, 35, 36
of yeast, 394, 395
Glycerol
control of catabolism of, 421
Glycerol dehydrase
and cobalamins, 231
and cobamide determinations, 231
molecular weight of, 231
reactions of, 226, 231
Glycerophosphate
acylation of, 304-6
and acyl carrier protein, 305, 306
as obligatory intermediate in phospholipid synthesis, 306
Glycogen
metabolism of
cyclic AMP effect, 274
maximal rates of, 261-63
tissue dependence of, 261, 263
Glycogen phosphorylase
crystals of, 36
Glycogen synthetase
regulation of
cyclic AMP effect, 151, 167
Glycolipids
glycosyl glycerides
biosynthesis of, 319
as cell wall precursors, 319
and chlorophyll, 319
distribution of, 318-20
in nonphotosynthetic bacteria, 319
Glycolysis
control mechanisms of and activation, 271
and adenine nucleotides, 271, 272, 280-84
diet effect, 270, 271, 283
feedback inhibition, 269, 270
in gluconeogenic tissues, 283, 284
and glyceraldehyde-3-phosphate dehydrogenase, 281
in glycolytic tissues, 280-83
hormone effect, 270, 271, 283
and macromolecular interactions, 274, 275, 285
methods of investigation of, 275-78
and Pasteur effect, 281-83
and pH, 274, 275
and phosphofructokinase, 280-84
by physical separation, 284, 285
and pyridine nucleotides, 282, 283
and rate-limiting steps, 275-77
and substrate availability, 273, 276-78, 280-83
enzymes unique to, 253, 255, 296
and glucose-6-phosphate metabolism, 259, 261
and glycogen metabolism, 261, 263
maximal rate of enzymes of determination of, 253, 275, 276, 296
and enzymes common to gluconeogenesis, 257-59, 296
phosphofructokinase, 253-55
pyruvate kinase, 253-55
and rate-limiting enzymes, 252, 253, 255
pathways of, 250-52
and pentose phosphate cycle, 263
tissue dependence of, 253, 255, 257, 259, 263, 264, 296
Grönwall, A.
and dextrans, 11

H

α-Haloacids
reactions of, with proteins, 706
α-Helix
in carbonic anhydrase, 34, 39, 448

in carboxypeptidase, 39
in chymotrypsin, 28, 39, 367, 448
and circular dichroism measurements, 445, 448
in cytochrome c, 35, 39, 448, 449, 745
in hemoglobin, 39, 448, 750
in lysozyme, 39, 363, 448
in myoglobin, 39, 363, 448, 750
and optical rotatory dispersion studies, 46, 444-46, 452
in papain, 35, 39, 448
in polypeptides, 445, 446
in ribonuclease, 32, 39, 366, 448
in ribosomal proteins, 444
Hemoglobin
abnormal
and deletions, 754
and function, 752-54
and heme interactions, 753, 754
and hemolysis, 753, 754
and sickling, 752, 753
structure of, 752-54
unstable, 753
comparative studies of
and conservation substitutions, 748-51
and function, 750-54
invariant residues in, 748-50, 754, 756
role of, 746
sequence studies, 747-59
and conformational changes, 381, 382, 393, 394
evolution of
and conformation, 729
and evolution of organisms, 755-59
factors influencing, 729
and gene duplication, 777, 778
and sequence studies, 732, 733, 748, 749, 754-59
and oxygen binding, 393, 394
structure of
and function, 750-54
general characteristics, 26
α-helix in, 39
heme group environment, 43
oxygenation effect, 41, 42, 393, 394
and pH titration, 46
and sequence studies, 747-59
subunits of, 746, 747, 751, 752, 756
synthesis of
and messenger RNA stability, 651, 652
and steroids, 653
Hexokinase
and carbohydrate metabolism, 259, 261
and glucokinase, 261, 281, 293, 294
and gluconeogenesis, 292
and mitochondria, 293
tissue distribution of, 259-61, 292-94
two forms of, 259-61
Hill equation
and deoxycytidylate deaminase, 218
Histamine
cyclic AMP effect, 150
Histidine
control of synthesis of
effector of, 423
genetic data, 422
and histidyl transfer RNA synthetase, 422, 423
and diazonium salts, coupling with, 710
iodination of, in proteins, 711, 712
oxidation of, in proteins, 716
Hjerten, S.
and chromatography, 16
and electrophoresis, 8, 14
von Hofsten, B.
and microbiology, 14
Homocysteine
methylation of
and aquocobalamin, 237, 238, 240
cobalt role in, 237-41
cyanocobalamin effect, 236, 237
and 5'-deoxyadenosyl cobalamin, 237
and methyl cobalamin, 240, 241
methyltetrahydrofolate role, 236-40
and propylation of transmethylase, 237-41
and S-adenosylmethionine, 236, 238-40
spectral data, 237-39
Homoserine dehydrogenase
in E. coli
and aspartokinases, 86-88, 392
feedback inhibition of, 86, 87, 392
inactivation of, 87
mutations in, 87
and NADP, 87
purification of, 87
Homoserine kinase, 88
Hormones
ACTH
lipolytic effect of, 158
catecholamines
lipolytic effect of, 158
cyclic AMP effect on, 149-69
epinephrine
formation of cyclic AMP, 149-52
and gluconeogenesis, 291
hepatic effects, 154
glucagon
and cyclic AMP levels, 289
and formation of cyclic AMP, 149, 150, 153, 157
and gluconeogenesis, 288-90
hepatic effects, 154
lipolytic effect of, 158
and pyruvate carboxylase, 288, 289
and gluconeogenesis, 269-72, 274, 286-92
and glycolysis, 270, 271, 283
insulin
antilipolytic effect of, 158, 159
and gluconeogenesis, 288, 289
and glucose transport, 292
and lipolysis, 158-61
methylxanthines
lipolytic effect of, 158
norepinephrine
and adenyl cyclase, 152
receptors of
"spare receptor" concept, 154
serotonin
lipolytic effect of, 160
theophylline
lipolytic effect of, 158
thyrotropin
lipolytic effect of, 158
in two-messenger system, 150
see also specific hormones
Horsfall, F.
and hemocyanins, 7
Hydrogenase
and nitrogenase, 346, 347
and nitrogen fixation, 343
Hydrogen exchange
in transfer RNA, 144
Hydroxysteroid dehydrogenase
substrates of
cyclohexanones, action on, 662
diamond lattice approach to, 661, 662

and enzyme-substrate interactions, 662, 667
NAD role, 662
specificity of, 662-66

I

Imidazole
stimulation of phosphodiesterase by, 153
Imidic esters
reactions of, with proteins, 702, 703
Immunoglobulin
allotypic variation in
and amino acid sequences, 501
extent of, 501
nature of, 501
amino acid sequences of
and allotypic variation, 501
and antibody specificity, 503, 506, 507, 515
and chain location, 503, 515
and charge heterogeneity, 502
determination of, 516, 517
in heavy chain, 499, 501, 502
and heterogeneity, 499, 501-3, 506, 507, 760, 762-68, 770
in light chain, 499, 501, 502, 507, 763-65, 767, 770
and antigens
and antibody heterogeneity, 508-10
ribonuclease as antigen, 508
simplified, 508-10
TMV as antigen, 508
charge heterogeneity in, 502
classes of
and combining site, 500
and subunit types, 500, 759
variety of, 499, 500, 759
combining site of
and antibody subclasses, 500, 501
and charge, 506
and conformation, 507, 515, 516
and polymeric antigens, 503, 504, 507, 508
and sequence studies, 499, 515
size of, 503, 504, 507
and specificity, 507, 515
functional properties of
and antibody heterogeneity, 504, 515, 766-72
diversity of, 503, 504
theories of, 768, 769
and time of immunization, 504
heavy chains of
and amino acid sequences, 499, 501, 502
and isotypic classes, 500
structure of, 499
heterogeneity of
and allotypic variation, 501, 505
and Bence-Jones proteins, 498, 499
biological basis of, 766-72
and charge, 502, 505, 506
classes of, 499, 500, 759
and conformation, 507, 509, 510
and electrophoretic examination, 502
and functional properties, 503, 504, 507-10, 515, 766-72
and idiotypic variation, 501, 502
and isotypic variation, 499-501, 505
limitations upon, 505-11
and protein evolution, 769
and sequence studies, 498, 499, 501-3, 506, 507, 760-67, 770
from a single cell, 504, 505
and structure studies, 497-99, 507
theories of, 768-72
homogeneous
and affinity labeling, 515
and antigenic stimulus, 511, 512
and clone dominance, 512
and clone propagation, 511
crystalline, 512
and macroglobulins, 513, 514
from a single cell, 511
and idiotypic variation, 501, 502
light chains of
amino acid sequences of, 499, 501, 502, 507, 763-65, 767
heterogeneity of, 499-502, 505
of homogeneous antibody, 512, 513
in macroglobulin, 513, 514
pathological, 761
and polymeric antigens
size of combining site, 503, 504
structure of
and amino acid sequences, 499, 501-3, 506, 507, 760, 762-68
and disulfide bonds, 760-62
enzymic fragments of, 760, 761
and heterogeneity, 497-99, 507, 759-72
subunit interaction in, 502, 759, 760
synthesis of
control of, 497, 498
and heterogeneity of proteins, 497, 498
Induced-fit hypothesis
and enzyme-substrate complex formation, 380, 381, 396-400
and hydroxysteriod dehydrogenase, 667
and protein conformation changes
in aldolase, 381
in carboxypeptidase, 382, 388, 389
in creatine kinase, 381
in cytochrome c, 381
in hemoglobin, 381, 389
in hexokinase, 384
inhibition of, 385, 386
in isoleucyl transfer RNA synthetase, 384, 385
and ligand-protein interactions, 381, 387, 397
and ligand size, 381, 382
in lysozyme, 382, 383, 388, 389
mechanism of induction of, 386, 388
and noncatalytic molecules, 383, 384
and polymeric substrates, 388, 389
quantity of change, 382
rate of, 389
in ribonuclease, 382, 383
and substrate conformation, 388
and temperature-activity curves, 381
in thiol subtilisin, 382
and two-ligand reactions, 381, 382
universality of, 382, 383
water role in, 384, 385
and template hypothesis, 380
Ingelman, B.
and dextrans, 11

Inosine 5'-phosphate dehydrogenase
control of, 216
Inotropic effect
of catecholamines, 156-58
cyclic AMP mediation, 156, 157
of methylxanthines, 157
of theophylline, 157
Insulin
antilipolytic effect of, 159
and cyclic AMP, 150, 158, 159, 161
and gluconeogenesis, 288, 289
and glucose transport, 292
hepatic effects of, 161, 162
phosphodiesterase stimulation by, 153
and protein synthesis
in muscle ribosomes, 652, 653
secretion of
and cyclic AMP, 151, 165-67
Iodine
reaction of, with proteins, 711, 712
Isoleucine
biosynthesis of
and α-aceto-α-hydroxyacid synthetases, 95
and cyclic hydroxamic acids, 95
and dihydroxyacid dehydrase, 94, 95
genetic aspects, 95, 96
in membrane fractions, 94
in mitochondria, 94
and reductoisomerase, 95
Isonitriles
and nitrogenase, 334, 335, 349, 350

K

KB cells
5S ribosomal RNA of
primary structure, 137, 140, 141
secondary structure, 137, 140, 141
Ketogenesis
cyclic AMP effect on, 151

L

Lactate dehydrogenase
isoenzymes of, 35
properties of, 36
β-Lactoglobulin
circular dichroism of, 451
Lactose
control of metabolism of
and β-galactosidase, 413, 414
and β-galactoside permease, 413, 414
induction of, 413, 414
and lac regulator gene, 413, 414
model of, 417, 418
and promoter, 417, 418
regulator of, 416-18
and lac regulator
interaction of, with DNA, 416-18
isolation of, 415
nature of, 415
quantity of, in cell, 416
stability of, 416
subunits of, 415, 416
Lamm, O.
and refractive index methods, 4, 6
Landsteiner, K.
and electrophoresis, 7
Lathyrism
and aldehydes in collagen, 564
and β-aminopropionitrile, 563
and collagen solubility, 556, 557, 563, 564
and copper deficiency, 565
and desmosines in elastin, 565
and lathyrogens
action of, 563-65
binding of, 564, 566
nature of, 563, 566
nature of, 553, 556, 557, 563, 564
Lecithin
biosynthesis of
and cytidine diphosphate choline, 309, 310
and evolution, 308
and S-adenosyl methionine, 308
and electron transport, 307, 308
as membrane constituent, 307, 308
molecular species of, 309
and phospholipases, 320
and plasmalogens, 316
Leghemoglobin
localization of, 337, 338
and nitrogenase, 337, 338
sources of, 337, 338
Levin, O.
and chromatography, 16
Ligand-protein interactions
effect on protein conformation
in carbonic anhydrase, 41
in carboxypeptidase, 41
in hemoglobin, 41
limits of measurement, 40
in lysozyme, 40, 41
in myoglobin, 40, 41
in ribonuclease, 41
Lipolysis
hormone effects on
and adenyl cyclase, 158
and cyclic AMP, 151, 158
and glucose oxidation, 160
Lipopolysaccharide
biosynthesis of
and phosphatidyl ethanolamine, 471
Longsworth, L. G.
and refractive index methods, 6
Luciferase
of bacteria
aldehyde role, 612-14
bioluminescence reaction, 610, 611
and conformational changes, 614
and dehydrogenase, 615, 616
enzyme intermediate lifetime in, 612
purification of, 615, 616
reactivation of, 616, 617
subunits of, 616, 617
of C. hilgendorfii
enzymology of, 601, 602
physical properties of, 600
of dinoflagellates
and guanine crystals, 620, 621
and scintillons, 619-21
soluble systems, 620
of firefly
ATP requirement of, 603, 604
binding sites of, 607
and color of luminescence, 605, 606
and conformational changes, 607
control of, 607, 608
and metals, 605
N-ethylmaleimide reaction, 708, 709
physical properties of, 604, 605
sequence studies, 604, 605
of fish, 602
of fungi, 617, 618
of jellyfish, 621-23
as a peroxidase, 618

of Renilla, 608, 609
Luciferin
of bacteria
FMN as bacterial luciferin, 610
and photochemical induction, 614, 615
reactions of, 610, 611, 614
of C. hilgendorfii
bioluminescence of, 600, 601
chemiluminescence of, 601
spectrum of, 600, 601
structure of, 600, 601
synthesis of, 600, 601
of dinoflagellates, 621
of firefly
analogues of, 604
and ATP requirement, 603, 604
structure of, 603, 605, 606
synthesis of, 604
of fish, 602
of fungi, 617, 618
of Latia, 603
of Odontosyllis, 602, 603
of Renilla
nature of, 609
reactions of, 609
and scintillons, 619-21
Luteinizing hormone
and cyclic AMP, 150, 163
and DNA synthesis initiation of, 639
steroidogenic action of, 163
Lysine
amidination of
in proteins, 703
fluorodinitrobenzene reaction with, 704, 705
guanidination of
in proteins, 701, 702
β-Lysine isomerase
cofactors of, 232, 233
metabolic role of, 232, 233
reaction mechanisms of, 232, 233
Lysolecithin
in chromaffin granules, 310
and phospholipase D, 323
Lysophospholipids
acylation of, 320-22
and cholesterol, 320, 321
and lecithinase A, 320
and phospholipase A, 320
and phospholipid deacylation, 320
and phospholipid restructuring, 320, 321
Lysozyme
active site of, 41, 42, 44
and bacterial spores, 56
binding to
in crystalline state, 44
circular dichroism of, 451
cleft in, 363-65
and diazonium salts, reaction with, 710, 711
fluorescence spectroscopy of, 46
guanidination of, 702
α-helix in, 39, 363, 448
inhibitors of
effect on structure, 40
mechanism of action, 44, 365, 377, 378
pH titration of, 46
structure of, 26, 37-40, 363-65
and substrate binding, 363-65

M

Malate dehydrogenase
properties of, 36
X-ray studies of, 35
Malmström, B.
and enzymology, 13
Melanocyte stimulating hormone
cyclic AMP effect on, 150
Membranes
from animal cells
isolation of, 465, 466
artifical
composition of, 481, 483, 488, 490
electrical excitability of, 485-87
formation of, 481, 482, 486, 489
and ion selectivity, 485, 489, 490
model systems, 480-82, 486, 488-90
and permeability, 483-85, 489, 490
properties of, 483-87, 489-91
structure of, 481, 482, 488
from bacteria
and cell walls, 464, 465
isolation of, 464-66
lipids of, 466
and mesosomes, 464, 465
categories of, 463
composition of, 464, 465
and DNA replication
initiation of, 479
in particulate fraction of cell, 479, 480
enzymes of
cytochrome oxidase, 470, 471
and electron transport, 475-77
β-hydroxybutyrate dehydrogenase, 470, 471
and lipid components, 470, 471
malate dehydrogenase, 471
succinic dehydrogenase, 470, 471
and glycosyl carrier lipid, 471-73
and lipid-glycosyl intermediates, 471-73
lipids of
cholesterol, 467, 468
and enzyme activities, 470, 473
and halophilic bacteria, 466, 467
and membrane structure, 466, 467, 473-78
phospholipids, 466, 467
and polysaccharide biosynthesis, 471-73
and proteins, 467
rare varieties, 466, 467
and lipopolysaccharide in gram-negative bacteria, 464, 465
optical rotatory dispersion of, 453, 454
origin of, 464
proteins of
enzymes, 470-73, 475, 478, 479
function of, 468-70, 475, 478
isolation of, 468-70, 475, 476
structure, 468-70, 473-75
and transport across membranes, 478, 479
of spores, 55, 73, 74
structural proteins of
and complex formation, 468
conformation of, 474, 475
and electron transport, 469
enzymatic functions of, 468-70
homogeneity of, 468, 469
isolation of, 469
in mitochondria, 468
structure of
and lipid-protein interactions, 473-76
lipid role, 473
models of, 473, 474

and proteins, 468-70, 472-75
and subunits, 473, 475-78
transport across
and osmotic shock, 478
and M-protein, 479
and phosphotransferase, 478, 479
protein factors in, 478
Messenger RNA
in bacterial spores, 63
in cytoplasm
and "informasomes", 649, 650
origin of, 649
and sequestration, 649, 650
and differentiation
in oocytes, 644, 645
in sea urchins, 644
in embryonic systems
timing of, 641, 642
varieties of, 642
and equimolar synthesis of operon enzymes, 428
maternal, 651, 652
and polar mutations
and chain-terminating codons, 426
direction of reading, 427
and frame-shift mutations, 426
and RNA synthesis, 426-28
polycistronic nature of, 425, 427
processing of
in cytoplasm, 649
in embryos, 651
"giant" heterogeneous RNA, 650
ribosomal RNA, 648, 649
and selective cleavage, 650, 651
by sequestration, 649, 650
and protein synthesis
control of, 413-15
and regulators, 415
quantity of
in cell, 425, 426
and sequential enzyme appearance, 428
size of, 425-27
stability of
and regulation, 429, 430
structure of
and initiation of peptide chains, 143
terminal nucleotides, 143, 144
termination of peptide chains, 143
synthesis of
control of, 413
direction of, 413
and transcription of DNA
control of, 641-48
DNA species copied, 644-47
and histones, 647, 648
inhibition of, 647, 648
timing of, 641-43
translation of
ambiguities in, 780, 781
control of, 651, 652
and differentiation, 653, 654
direction of, 413
and hemoglobin synthesis, 651, 652
and hormones, 652, 653
and microheterogeneity in proteins, 780, 781
and stability, 651
Metabolism
control of
and maximal catalytic capacity, 252, 253
methods of investigation, 275-78
and rate-limiting enzymes, 252, 275-77
"futile" cycles in, 284, 285, 295, 296
Methane
formation of
and aquocobamide, 242, 243
ATP role, 241-43
carbon sources, 241, 242
and methylcobalamin, 241, 242
methyl donors in, 242
and methyltetrahydrofolate, 241-43
Methionine
biosynthesis of
cobalamin role, 90-92, 236-41
and cystathionine, 90
and homocysteine biosynthesis, 90
homoserine acylation, 89
methylation of homocysteine, 90-92, 236-41
regulation of, 90-93
and S-adenosylmethionine, 91, 92, 236-40
structural genes for, 92, 93
and tetrahydrofolate metabolism, 90-92, 236-41
and vitamin $B_{12}$, 90-92
oxidation of
with hydrogen peroxide, 714-16
and steroid biosynthesis, 686, 688, 689
and tuberculostearic acid biosynthesis, 688
O-Methylisourea
reaction of
with proteins, 701, 702
Methylmalonyl CoA-mutase
reactions of, 226-28
stereospecificity of, 227, 228
Methyltetrahydrofolate
and acetate biosynthesis, 243, 244
and homocysteine methylation, 236-41
and methane formation, 241-43
Methyl transfer
and cobalt, 237, 240, 241
and methyltetrahydrofolate, 236-41
Methylxanthines
inotropic effect of, 157
insulin-releasing effect, 165, 166
lipolytic effect of, 158
and phosphodiesterase, inhibition by, 153
salivary glands, effect in, 165
Microtubule structures
and cytoplasmic movements, 539
and mitotic apparatus, 539
Mitochondria
optical rotatory dispersion of, 453, 454
Monoglycerides
acylation of
and coenzyme A, 304, 305
and glycerophosphate, 304
Mononucleotide pyrophosphorylase
and feedback inhibition, 212
and phosphoribosyl pyrophosphate
inhibition of, 211, 212
specific enzymes, 211, 212
and uric acid accumulation, 212
Morphogenesis
control of, 634, 735
definition of, 634
Muscle
actin of
and nucleotides, 528, 529
physical properties of, 528

terminal peptide of, 528
α-actinin of
and contractility, 527, 528
molecular weight, 527, 528
β-actinin of, 528
energetics of, 535, 536
heart
cyclic AMP in, 156
and myofilament structure
and actin, 536, 537
calcium control of, 537
and contraction, 536, 538
model of, 538
and tropin, 536, 537
and tropomyosin, 536, 537
X-ray studies of, 537, 538
myosin of
and ATPase, 534, 535
fragments of, 531-34
molecular weight of, 530, 532
purity of, 529, 530
shape of, 530, 531
subunits of, 530, 531
and ultraviolet difference spectra, 534
smooth muscle
cyclic AMP in, 157, 158
tropomyosin of
aggregation of, 526
dimensions of, 526
and F-actin, 526
α-helix in, 526
molecular weight of, 526
and myofilament structure, 536, 537
subunits of, 526
sulfhydryl groups of, 526
troponin of
and calcium, 527
function of, 526, 527
and myofilament structure, 536, 537
in thin filaments, 527
Mutagens
and DNA replication, 188
and structural damage in DNA, 176, 177, 185
and ultraviolet-sensitive mutants of E. coli, 181, 185
Mutations
to chain terminating codons, 776, 777
frameshift mutations
and DNA repair synthesis, 190
result of, 773
and gene duplication, 775, 776
point mutations
and amino acid substitutions in proteins, 772, 773
polar, 426-28
and sequence deletions, 773-75
to ultraviolet sensitivity, 179
Myeloma proteins
as immunoglobulins
induction of, 514
and natural antibodies, 513
screening of, 512, 513
Myoglobin
as an antigen, 510, 511
comparative studies of
and evolution of, 754-57
and function of, 750, 751
role of, 746
structure of
conservative substitutions in, 748-51
and function, 750, 751
general characteristics, 26, 37, 38, 43
α-helix in, 39, 363, 448, 750
heme group binding, 43
heme group environment, 43
invariant residues in, 748-50, 756
ligand effect, 40, 42
and nonpolar residues, 747-79
and pH titration, 46
sequence studies, 747-51, 756
Myosin
and actin, 533, 534
ATPase of
activity of, 535
binding sites of, 534, 535
and phosphate release, 535
structure of, 534, 535
binding sites of, 534
fragments of
and ATPase, 533, 534
definition of, 531, 532
formation of, 531-34
homogeneity of, 532
tail section of, 531, 533
molecular weight of, 530, 532, 535
and myofilament structure, 536, 537
N-ethylmaleimide reaction, 708, 709
purity of, 529, 530
shape of, 530, 531
subunits of, 530, 531
and ultraviolet difference spectra, 534

N

Neurospora crassa
aspartate semialdehyde dehydrogenase of, 86
chorismate mutase of, 99
isoleucine biosynthesis in, 94
membrane proteins of, 469
methionine biosynthesis in, 89
tryptophan synthesis in, 102, 103, 105
valine biosynthesis in, 94
Nicotinamide adenine dinucleotide ($NAD^+$)
and alcohol dehydrogenase, 666
and bioluminescence
in bacteria, 610, 615, 616
in fungi, 617
in jellyfish, 621, 622
and control of metabolic pathways, 252, 271, 272, 282, 283
and glyceraldehyde 3-phosphate dehydrogenase, 394, 395
and hydroxysteroid dehydrogenase, 662-64
and steroid hydroxylation, 673
and steroid isomerase, 669-71
see also $DPN^+$
Nicotinamide adenine dinucleotide phosphate ($NADP^+$)
and aspartokinase, 85, 86, 392
and cholesterol side-chain cleavage, 678-80
and homoserine dehydrogenase, 86, 87
and steroid hydroxylation, 672-76
and steroid isomerase, 670
see also $TPN^+$
Nicotinic acid
as antilipolytic agent, 159
phosphodiesterase stimulation, 154, 159
Nitrogen
fixation of
see Nitrogen fixation
inorganic complexes of
nitrogen orientation in, 353
variety of, 334, 335, 352, 353
Nitrogenase
assay of, 333-35, 340, 341,

343, 345, 348
and ATP-dependent hydrogen evolution, 334, 335, 340, 346, 347
components of
iron protein, 334, 335, 339, 350
molybdo-iron protein, 334, 335, 339, 341, 350
definition of, 332
energy requirements of, 334, 335, 340, 341
and ferredoxin, 334-37
and flavodoxin, 334-37
fractionation of, 338, 339
and hydrogenase, 343, 346, 347
and hydrosulfite, 341
inactivation of, 338
inhibition of
competitive, 343, 344, 347-50, 353
and electron transfer, 344
and enzyme inactivation, 344
by nitric oxide, 344
kinetics of, 342
and leghemoglobin, 337, 338
mechanism of
and conformational changes, 350, 351
and electron activation, 350, 351
inorganic model of, 334, 335, 346, 347, 352
and nitrogen bonding, 351, 352
and substrates, 334, 335, 344, 345, 349-51
two site hypothesis, 345, 346, 350-52
as multiprotein complex, 332
nomenclature of, 339
and paramagnetic proteins, 337
pH effect, 342
phosphate exchange reactions of, 341
purification of, 338, 339
reactions of, 332, 334, 335, 339, 340, 342, 343
and reductant-dependent ATPase, 334, 335, 340
relevance of in vivo reaction energy requirement, 342, 343
and hydrogenase, 343
requirements of
ATP, 333-35, 340-42, 347, 350-52
electron donor, 334-37, 340, 345-47
iron, 338, 350-52
metals, 338, 340-42, 350-52
molybdenum, 338, 341, 350-52
reductant, 333-36, 340-42, 348-50
substrates of
and inhibition, 344, 345, 347-49
and nitrogen, 334, 335, 345
range of, 334, 335, 344, 345, 347
steric factors, 345-47, 349, 350
sulfide, 338
Nitrogen fixation
capability of
distribution, 332
in cell-free systems
components of, 334, 335, 339
purification of, 338, 339
reproducibility of, 333-35
requirements of, 332-38
sources of, 333-35
intermediates in, 345-47
mechanism of, 350-52
and nitrogenase reaction, 338-54
Nitrous acid
reaction of
with proteins, 712
Nitrous oxide
and nitrogenase, 334, 335, 347, 348
Nobel Foundation
and Tiselius, 20-22
Nobel prize
and Tiselius, 11-13
Norepinephrine
and adenyl cyclase
effect on, 152
see also Hormones
Nucleases
in bacterial spores, 64
endonuclease I of E. coli, 191, 192
endonucleases
in B. subtilis, 192
in E. coli, 192
in M. lusodeikticus, 192
exonuclease I
action of, 192
in recombination deficient E. coli, 186
exonuclease II
action of, 192
association with DNA polymerase, 192
in recombination deficient E. coli, 186
exonuclease III
action of, 192, 193, 196
in recombination deficient E. coli, 186
and partial digestion of RNA, 144
Nucleosides
dihydrouridine
extinction coefficient, 136
in transfer RNA, 133-36
dimethylguanosine
in transfer RNA, 133, 134
inosine
in anticodons, 144
1-methylinosine in transfer RNA, 136
1-methyladenosine
in transfer RNA, 135, 136
5-methylcytidine
in transfer RNA, 135
7-methylguanosine
in transfer RNA, 136
2'-O-methylnucleosides
in transfer RNA, 134, 135, 144
minor components of transfer RNA, 131-37, 144-46
$N^6$-acetyl cytidine
in transfer RNA, 136
$N^6$-dimethyladenosine
in transfer RNA, 135
$N^6$-$\Delta^2$ isopentenyladenosine
in transfer RNA, 135
nucleoside diphosphate termini in RNA, 138, 139, 141, 142
pseudouridine
in transfer RNA, 133, 134, 144
Nucleotide biosynthesis
control of
and activation, 203, 204, 213, 216-18
and allosteric modification, 201-3, 205-7, 209, 213, 215, 217, 218
and feedback inhibition, 201-6, 211-13, 218-20
and repression, 201-3, 206-8, 210, 219, 220
and deoxycytidylate deaminase, 216-19
and inosine-5'-phosphate dehydrogenase, 216
pathways of
and aspartate transcarbamylase, 204
and carbamyl phosphate synthesis, 202-4
and phosphoribosylpyrophosphate, 204, 205
and purine biosynthesis, 202, 205, 206
salvage pathway, 211-14

salvage pathway of
enzymes of, 211-14
importance of, 211, 212
and mononucleotide pyrophosphorylase of, 211, 212
pyrimidine ribonucleoside kinase of, 214
and thymidine kinase, 212-14
and thymidylate kinase, 219, 220
and thymidylate synthetase, 219, 220
Nucleotides
and adenyl cyclase
stimulation of, 152, 153
biosynthesis of
see Nucleotide biosynthesis
cyclic AMP, 149-69
excited states of, 573, 574, 581
fluorescence decay times of, 574
intersystem crossing yields of, 573, 574
optical rotatory dispersion of, 437-40
properties of
fluorescence decay times, 574
intersystem crossing yields, 573-75
spectra, 573
ratios of, and enzyme control
in gluconeogenesis, 272-74, 284, 285
in glycolysis, 271, 272, 280-84
spectra of, at 77 K, 573

O

Operon
definition of, 412
Optical activity
symmetry rules
and asymmetric potential, 455, 457-59
and Cotton effects, 456, 459
and molecular geometry, 456
requirements, 455-59
and rotatory strength, 457
Optical rotatory dispersion
of antibodies, 502, 507
of heme proteins, 452
of homopolynucleotides, 440
of immunoglobulins, 502
of membranes
and α-helix, 453, 474, 475
and structural models, 454
of mitochondria, 453, 454
of polypeptides
and α-helix, 445
and random coil conformation, 445
and β structure, 446, 447
of polysaccharides
blood group substances, 454, 455
and conformation, 454, 455
of proteins
carbonic anhydrase, 448
cytochrome c, 448
and α-helix content, 46, 444-46, 452
heme proteins, 452, 453
and random coil conformation, 445
ribosomal, 444
and β structure, 445-47
of ribosomes
protein contribution, 443, 444
RNA contribution, 443
of RNA
calculated valves, 440
and double-stranded structure, 440, 441, 443
ribosomal, 440, 441, 443
of TMV, 437, 438, 440, 445
transfer RNA, 144
and side-chain activity in proteins, 449
and structure in crystals, 448, 449
of trinucleoside diphosphates
calculated values, 437-40
conformation, 438
experimental results, 439, 440
and nearest-neighbor interactions, 438
and nucleotide sequence determinations, 437, 438
of viruses, 444
Ouabain
as antilipolytic agent, 159
and toad bladder
effect in, 164
Oxidative phosphorylation
inhibitors of
effect on lipolysis, 159
Oxytocin
circular dichroism of, 449

P

Papain
guanidination of, 702
properties of, 26
structure of
active site, 35
α-helix in, 35, 39
Pederson, K. O.
and Tiselius, 6
Penicillinase
control of
genetic data, 420, 421
nature of, 420, 421
Pentose phosphate cycle
and glucose-6-phosphate metabolism, 263
maximal rates of enzymes of, 262, 263
metabolic role of, 263
tissue dependence of, 263
Pepsin
circular dichroism of, 451
Pepsinogen
circular dichroism of, 451
Phenylalanine
biosynthesis of
anthranilate synthetase role, 99, 100
chorismate inhibition of, 97-99
chorismate mutase role, 98, 99
chorismate synthetase role, 98
control of, 97-105
DAHP synthetase role, 97-100
enzyme aggregates in, 98-103
feedback inhibition in, 97-100
genetics of, 97, 105
permease role, 105
phenylalanine effect, 97-100
prephenate dehydrogenase role, 99, 100
prephenate inhibition of, 97, 98
shikimate kinase role, 99
tryptophan effect, 97, 99, 100
tyrosine effect, 97-99
Philpot, J.
and refractive index methods, 6
Phosphatidic acid
biosynthesis of
and acyl carrier protein, 304, 305
and coenzyme A, 304, 305
and glyceride phosphokinase, 306

from glycerophosphate, 304-6
and microsomes, 304
hydrolysis of, 304
Phosphatidyl choline
see Lecithin
Phosphatidyl ethanolamine
biosynthesis of
and cytidine diphosphate, 307, 309
and methylated ethanolamines, 307
and unnatural bases, 307
and lecithin biosynthesis
S-adenosylmethionine role, 308
and lipopolysaccharide biosynthesis, 471
Phosphatidyl glycerol
amino acyl derivatives of
chemical synthesis of, 312
formation of, 311
and transfer RNA, 311
biosynthesis of, 306, 307, 311
and cardiolipin
as degradation product of, 310, 311
as precursor of, 310, 313
structure of, 312, 313
diether analogue of, 318
glucosamine derivatives of, 312
ornithyl derivative of, 312
and phosphatidyl glycerophosphate, 310, 311
structures of, 310, 311
Phosphatidyl inositol
biosynthesis of, 306, 307, 313
degradation of, 313, 314
and guanosine diphosphate mannose, 314
mannosides of, 314
phosphorylation of, 313
Phosphatidyl serine
biosynthesis of, 306, 307
Phosphodiesterase
action on transfer RNA, 146
inactivation of cyclic AMP by, 149, 150
distribution of, 153
in E. coli, 153
inhibition of
by ATP, 153
by benzothiadiazine derivatives, 153
by citrate, 153
by diazoxide, 167
by methylxanthines, 153
by puromycin, 153
by pyrophosphate, 153
by tri-idothyronine, 154
stimulation of
by imidazole, 153
by insulin, 154
by nicotinic acid, 154
Phosphofructokinase
activation of
and cyclic AMP, 151, 167, 168
Phosphoinositides
metabolism of, 313, 314
Phospholipase D
activation of, 323
and transphosphatidylation
and alcohols, 322, 323
analogue preparation using, 322
relation to hydrolysis, 322
Phospholipids
in bacteria, 55
and enzyme activation, 470, 471
metabolism of
hormone effects on, 165
in spores, 55
Phosphonolipids
and aminoethylphosphonate, 318
nature of, 318
origin of, 318
Phosphoribosylpyrophosphate
biosynthesis of
control of, 204, 205
Phosphorylase
activation of
catecholamine effect on, 157
cyclic AMP effect, 151, 155-58
and inotropic response, 156, 157
and allosteric effects, 393
in a multienzyme complex, 393
Phytoproteins
aequorin
and calcium role, 598, 621, 622
excitation spectrum, 622
nature of, 622
reaction of, 622
of shrimp, 623
Phytosterol
side chain of
biosynthesis of, 686-89
with 2-carbon fragment at C-24, 688, 689
and methionine, 686-89
origin of, 686
and tuberculostearic acid synthesis, 688
Pineal gland
adenyl cyclase in, 152
effect of norepinephrine on, 152
Plasmalogens
biosynthesis of, 312, 315-17
and diet, 315
importance of, 314
methylation of, 323
and plasmalogenic acid, 314
and saturated ether linkages, 315
structure of, 314
Polar mutants
definition of, 426
gradient of polarity in, 426
mechanism of action of, 426-28
nature of, 426
Point mutations
and single amino acid substitutions, 772, 773
Polyacrylamide
and gel filtration, 16, 17
and zone electrophoresis, 14
Polynucleotide kinase
and polynucleotide ligase assay, 195
Polynucleotide ligase
and bacteriophage λ
formation of circular DNA, 194
in bacteriophage T4 infected E. coli
action of, 195
ATP requirement of, 195
presence in, 194
substrate for, 195
in E. coli
action of, 194
requirements of, 194
and infectious DNA synthesis, 195
in recombination deficient E. coli, 186
substrates of
bacteriophage λ DNA as, 194-96
homopolymers as, 194
polynucleotide kinase, use in preparation of, 195
Polynucleotides
circular dichroism of, 441-43
DNA
and acridine dyes, 588-91, 593
alkylation of, 178, 179
and DNA polymerase, 193
energy transfer in, 582-86, 588-92
fluorescence of, 575

and genetic recombination, 183-90
infectious, synthesis of, 195, 196
and mutation, 572
nuclease action on, 191-93
phosphoresence of, 575
and polynucleotide ligase, 193-95
repair of, 175-96
single-strand breaks in, 177
and thymine dimer formation, 177, 178, 572, 588
and ultraviolet-sensitive E. coli, 179-82
energy transfer in
and coupling between chromophores, 576-78
distances of, 576, 577
DNA, 572, 582-86
and excited state dimers, 575
and fluorescence, 575, 586
mechanisms of, 576
poly dAT, 581, 582
polyriboadenylic acid, 586, 587
singlet-singlet, 576, 577
and thymine dimer formation, 588
triplet-singlet, 577, 578
triplet-triplet, 577
fluorescence of, 575-77
optical rotatory dispersion of, 437-45
phosphorescence of, 575
poly dAT
energy transfer in, 581, 582
polyriboadenylic acid
energy transfer in, 586, 587
RNA
see specific types of RNA
in spores, 56, 57
see also specific polynucleotides
Porath, J.
and gel filtration, 16
and electrophoresis, 13
Potassium
and cyclic AMP levels, 155
Pregnenolone
biosynthesis of, 678, 679
Progesterone
and androgen biosythesis, 679
biosynthesis of, 678, 679
and testosterone biosynthesis, 679
Prostaglandins
as antilipolytic agents, 159
and cyclic AMP, 150, 159
in toad bladder
effect, 164
Proteases
and sporulation, 72, 73
see also specific enzymes
Proteins
acrylonitrile
reaction with, 709
acylation of
by acid anhydrides, 698, 699
amidination, 702, 703
an carbon disulfide, 700, 701
and cyanate, 701
with ethyltrifluoracetate, 699, 700
guanidination, 701, 702
mechanism of, 698
nitroguanidination, 702
and O-methylisourea, 701, 702
reversible, 699, 700
with succinic anhydride, 699
and sulfonation, 703, 704
with trifluoroacetic anhydride, 699, 700
tyrosine of, 698, 699
alkylation of
with benzyl halides, 707
with iodoacetamide, 706
with iodacetic acid, 706
mechanism of, 706, 707
with sulfenyl halides, 707, 708
and tryptophan, 707
amidination of, 702, 703
arginine of
and benzil, 713
and cyclohexan-1,2-dione, 713
and glyoxal, 713
and malonaldehyde, 712, 713
reactions of, 712-14
arylation of
with chlorodinitrobenzene, 705
and cyanuric fluoride, 705, 706
with fluorodinitrobenzene, 704, 705
mechanism of, 704
with trinitrobenzenesulfonic acid, 705
carbamylation of, 701
carboxyl groups in
alkylation of, 708
circular dichroism of, 445-54
crystallography of
see X-ray crystallography
dansylation of, 703, 704
deamination of
with nitrous acid, 712
and diazonium salts
and histidine, coupling with, 710
ribonuclease, reaction with, 710, 711
and tyrosine, coupling with, 710
evolution of
see Evolution of proteins
functional groups of
reactivity of, 696, 697
and structure, 696-98
group specific reagents for
definition of, 696
guanidination of
and enzyme activity, 698, 699
and lysine residues, 698
and nitration, 702
iodination of
and histidine, 711, 712
products of, 711
reactivity of iodine, 711
and tyrosine, 711
modification of
and conformational changes, 719
and peptide bond cleavage, 718, 719
selective, 696, 698
specific, 696, 698
and N-alkylmaleimides
mechanism of, 708
N-ethylmaleimide, 708, 709
and sulfhydryl groups, 708, 709
nitroguanidination of, 702
optical rotatory dispersion of, 443-54
oxidation of
and cysteine, 714, 715
electrolytic, 716, 717
and histidine, 716
by hydrogen peroxide, 714-16
and methionine, 714, 715
with N-bromosuccinimide, 716
photochemical, 716
and tryptophan, 715, 716
and quinones
reaction with, 714
reduction of
carboxyl groups of, 717
disulfide bonds of, 717
methods of, 717
and reporter groups
definition of, 717, 718

selective reactivity of, 717, 718
in spores, 53-65
structure of
see Protein structure
sulfonation of, 703, 704
synthesis of
see Protein synthesis
and tetranitromethane reaction of, with tyrosine, 707, 708
tryptophan in
alkylation of, 707
turnover of
during sporulation, 71-73
X-ray studies of
see X-ray crystallography
see also specific proteins and techniques
Protein structure
alteration of
at chain ends, 776, 777
and convergent evolution, 778-80
by deletions, 773-75
and elongation of chains, 774-77
and frame-shift mutations, 773
and gene duplication, 777, 778
by point mutations, 772, 773
and repeating sequences, 775, 776
comparative studies of
and ancestral homology, 730-34, 739, 743
and chain elongation, 775-77
with cytochome c, 729, 732-46
and deletions, 734, 735, 737, 762-65
and development, 729, 730
with hemoglobin, 732, 733, 746-54, 756
with immunoglobulins, 757, 759-72
and invariant residues, 733, 734, 737, 748, 749, 756, 762-66
with myoglobin, 746-54, 756
and protein evolution, 728-36, 777, 778
and structure-function relationships, 730, 738, 739, 744-46
conformation
in cytochrome c, 35, 744, 745
and evolution of proteins, 729, 730
in hemoglobin, 37, 746-52
in myoglobin, 37, 746-52
X-ray studies, 25-47
and conformational motility, 39-42
and development, 729-30
and electrostatic interactions, 42
evolution of
and average mutation value, 731, 732
and conformation, 729
convergent, 732, 733, 778, 779
in cytochrome c, 734, 736-44
and deletions, 734, 735, 773-75
and evolution of organisms, 728, 729, 777, 778
factors influencing, 729
and fibrinopeptides, 735, 736
and gene duplication, 777, 778
in hemoglobin, 732, 733, 754-59
and homology of structure, 730-36
and immunoglobulins, 759
and invariant residues, 733, 734
in myoglobin, 754-59
and point mutations, 772, 773
and phylogeny, 735, 736, 739, 742-44
unit evolutionary period, 741, 742, 755-57
and function
comparative studies, 730, 744-46
in cytochrome c, 736-39, 744
and deletions, 734, 735
and divergent evolution, 778-80
in hemoglobin, 750-54
of immunoglobulins, 766-72
invariant residues, 730, 733, 734, 744, 745
in myoglobin, 750, 751
and α-helix, 39, 443-54
microheterogeneity of
and gene multiplicity, 780
and translational ambiguities, 780, 781
and mutagens, 729, 730, 772, 773
and pH titrations, 46
and phylogeny, 735, 736, 740, 742-44
in solution, 44-48
Protein synthesis
in bacterial spores, 62-64
inhibition of
cyclic AMP effect on, 151
and steroidogenic response, 162
initiation of peptide chains with viral RNA, 141-43
ribosome function in
30S subunit, 109
50S subunit, 109
in sporulation, 67-70
steroidogenic response involvement in, 162
and termination of peptide chains with viral RNA, 141-43
Protein turnover
during sporulation, 71-73
Protoplasmic streaming
and actin, 539
and myxomyosin, 538, 539
Pseudomonas testosteroni
hydroxysteroid dehydrogenase of
and cyclohexanones, action of, 662
enzyme substrate interactions, 662, 663
NAD role, 662
reactions of, 662
steric specificity of, 662-66
steroid degradation by, 681, 682
steroid isomerase of
mechanism of, 668, 669, 671
reactions of, 668
and steroid dehydrogenase, 671
Purines
biosynthesis of
and allosteric effects, 205
control of, 205, 206
enzymes of, 202, 205, 206
nonenzymic steps, 205
Puromycin
inhibition of phosphodiesterase by, 153
Pyrimidine ribonucleoside kinase, 214
Pyrimidines
and ultraviolet irradiation
and conjugation in bacteria, 188
and dimer excision in DNA, 180, 185, 187
and dimer formation in DNA, 178
Pyruvate
adenyl cyclase

effect on, 153
metabolism of
and intracellular enzyme localization, 265-67
and pyruvate carboxylase, 256, 267, 268, 279, 288, 289
and pyruvate kinase, 253-55, 269, 270, 284, 285
Pyruvate kinase
and "futile" cycles, 284, 285
properties of
maximal rate of, 253-55, 269, 270
in various tissues, 253

Q

Quinones
reactions of
with proteins, 714

R

Rabbit reticulocytes
RNA of
terminal nucleotides of, 142
Rat liver
adrenal corticosteroid effects in, 287, 288
gluconeogenesis in, 255-59, 265
glucose-6-phosphate metabolism in, 259-61
glucose uptake in, 294
glycolysis in, 253-55, 265
pentose phosphate pathway in, 261-63
phosphoenolpyruvate carboxykinase of, 255-57, 270, 271
pyruvate kinase of, 253
repression of enzymes in, 259
ribonucleotide reduction in, 210
transfer RNA of
terminal nucleotides of, 138, 139
Recombination
deficient mutants of E. coli
DNA strand rejoining in, 185-87
enzymes in, 186
and genetic crosses, 186
and pyrimidine dimers, excision of, 184, 185
and strand exchange, 190
and ultraviolet sensitivity, 183-86
and DNA repair, 190, 191
and evolution of proteins, 772-78
Regulation
and allosteric effects, 201-9, 213-18, 361, 362, 389-400, 607
allosteric site of an enzyme
definition of, 361, 362
and aspartate transcarbamylase, 390, 391
and catabolite repression, 429
and differentiation
relevance of mechanisms of, 632, 633
and DNA
transcription of, 641-51
and effectors
and arabinose catabolism, 418
and galactose catabolism, 419, 420
and induction, 413
and lactose utilization, 413, 414
nature of, 413
and repression, 413
as substrates, 413, 414
and enzyme evolution, 402, 404, 405
and enzyme flexibility, 389, 390
and escape, 428, 429
and glucose effect, 429
and glutamine synthetase, 391, 392
and glyceraldehyde-3-phosphate dehydrogenase, 394, 395
and hemoglobin, 393, 394
and induction
in arabinose catabolism, 418, 419
and galactose catabolism, 419, 420
and glycerol catabolism, 421
and lactose utilization, 413-18
and penicillinase, 420, 421
and ligands
definition of, 362
and messenger RNA
and equimolar formation of operon enzymes, 428
polycistronic nature of, 425
and sequential enzyme appearance, 428
size of, 425-27
stability of, 429, 430
models of
negative control model, 414-18, 420
sequential model, 361, 396, 398-400
symmetry model, 361, 396, 398-400
and multienzyme complexes, 392, 393
operon
definition of, 412
and polar mutations
nature of, 426
and RNA synthesis, 426-28
and promoters
definition of, 412, 413
location of, on lac operon, 417
of protein synthesis
mechanisms, 652
and regulator molecules
interaction with DNA, 416, 417
isolation of, 415
nature of, 412, 413, 430
and positive control, 418, 419
quantity in cell, 416
regulatory site of an enzyme
definition of, 362
and repression
and alkaline phosphatase, 424
and arginine biosynthesis, 424
effector identification, 421, 422
and histidine catabolism, 422, 423
and tryptophan biosynthesis, 423, 424
and ribonucleoside diphosphate reductase, 392
and subunit structure, 390
Reporter reagents
reactions of
with proteins, 717, 718
Ribonuclease A
activity in crystalline state, 44
acylation of
reversible, 699, 700
as an antigen, 508, 509
carbamylation of, 701
chemical studies of, 365, 366
circular dichroism of, 449-51
conformation of
$\alpha$-helix in, 39
and histidine residues, 365, 366
similarity to ribonuclease S, 31, 40
dansylation of, 703, 704
and diazonium salts
reaction with, 710, 711
fluorodinitrobenzene

reaction with, 703-5
guanidination of, 702
mechanism of action of, 30
primary structure of, 30, 365, 366
properties of, 26
substrate binding by, 366
Ribonuclease S
activity in crystalline state, 44
conformation of
and active site of, 33, 43, 365, 366
diagram of, 31
α-helix in, 32, 39, 366
and histidine residues, 365, 366
hydrophobic core in, 32
inhibitor effect on, 40, 41
molecular surface of, 32, 366
pleated-sheet structure in, 32
similarity to ribonuclease A, 31, 40
and S-peptide:S-protein interactions, 32
formation of
from ribonuclease A, 30
properties of, 26, 365, 366
S-peptide of, 30, 39
S-protein of, 30
Ribonucleic acid (RNA)
in bacterial spores, 57, 62-64
biosynthesis of
and cytodifferentiation, 645, 646
in embryos, 641-44
messenger, 641-48
circular dichroism of, 441
"giant heterogeneous"
function of, 650
and messenger RNA, 650
in nucleus, 650
nucleotide sequences in
see RNA, primary structure of
optical rotatory dispersion of, 437, 438, 440, 441, 443, 445
primary structure of
messenger RNA, 143, 144
and optical rotatory dispersion studies, 437, 438
ribosomal RNA, 137, 140-42
5S RNA, 126, 137, 140, 141, 146
and terminal nucleotides, 125, 137-39, 141-43
transfer RNA, 131-39
viral RNA, 141-43
secondary structure of
base pairs in, 126, 133-35
cloverleaf model of transfer RNA, 133-35
varieties of, 642
see also Messenger RNA, Transfer RNA, etc.
RNA polymerase
in Bacillus sp. spores, 62
and control of RNA synthesis, 417
and ribosomal RNA biosynthesis, 122
Ribonucleotide reductase
allosteric effects in, 206, 207, 209, 235, 236
in animal cells, 210, 211
and 5'-deoxyadenosylcobalamin anilide, 233, 234
5'-deoxyadenosylcobalamin role, 208, 209, 234-36
and dihydrolipoate, 210, 233, 234, 236
and dioldehydrase, 234
of E. coli
allosteric effects in, 206, 207
binding sites of, 207
components of, 206
conformation of, 206
control of, 207, 208
and deoxyribonucleotide accumulation, 207, 208
depression of, 208
and dihydrolipoate, 206
and feedback inhibition, 207, 208
kinetics of, 206, 207
magnesium effect on, 206
and nucleoside triphosphates, 206
repression of, 207, 208
and hydrogen transfer, 234, 235
of L. leichmannii
allosteric effects in, 209
conformation of, 209
control of, 209, 210
and cyanocobalamin, 210
and 5'-deoxyadenosylcobalamin, 208
and feedback inhibition, 209
magnesium, effect on, 208, 209
nucleotides, effect on, 208, 209
repression of, 210
mechanism of reaction, 234-36
purification of, 236
reactions of, 233
reductants of, 233
and thioredoxin, 210, 233, 234, 236
and thioredoxin reductase, 233, 234
Ribonucleotide reduction
in animal cells
and dihydrolipoate, 210
and DNA synthesis, 210, 211
and nucleoside triphosphates, 210, 211
pathways of, 210
regulation of, 210, 211
and thioredoxin, 210
in E. coli, 206-8
in L. leichmannii, 208-10
Ribosomal protein
biosynthesis of
genetics of, 124, 125
and precursor particles, 123
and ribosomal RNA, 123, 124
site of, 123
composition of, 112
fractionation of, 112-14
heterogeneity of, 112
molecular weight of, 112
optical rotatory dispersion of, 443, 444
species-specificity of, 112, 113
in temperature-sensitive mutants, 125
Ribosomal RNA
in bacterial spores, 57, 63, 64
biosynthesis of
DNA role in, 122, 640, 641, 648, 649
in eukaryotic cells, 648, 649
genetics of, 122, 123, 125
mechanism of, 122, 123
in oocytes, 644, 645
in oogenesis, 640
in sea urchin embryos, 643, 644
and hybrid formation, 122, 123
incorporation into ribosomes, 120, 121
as messenger for ribosomal protein, 123-25
methylation of, 120, 121
molecular species of, 124, 126, 141
optical rotatory dispersion of, 443, 444

precursors of, 117, 118
from rabbit reticulocyte, 141, 142
5S RNA component of
origin of, 111
structure of, 126, 137, 140, 141, 146
terminal nucleotides of, 111, 137, 140, 141
16S RNA component of
base composition of, 110
minor components of, 110, 111
molecular weight of, 109, 110, 125
origin of, 109, 110
terminal nucleotides of, 110, 111, 125, 141, 142
23S RNA component of
base composition of, 110
as a dimer, 109, 110
minor components of, 110, 111
molecular weight of, 109, 110, 125
origin of, 109, 110
terminal nucleotides of, 110, 111, 125, 141, 142
in ribosomes
form, 113, 114
structure of, 137, 140-42
terminal nucleotides of, 124, 125, 141-43
from wheat germ, 141, 142
from yeast, 141, 142
Ribosomes
assembly of
in vitro, 114, 118-20
in bacterial spores
and protein synthesis, 57
RNA of, 57
dissociation of, 114
formation of
and chloramphenicol particles, 116, 117
and eosomes, 115
and FU-particles, 120
and KD-particles, 119
methods of study of, 115-17
and neosomes, 115
precursors of, 115-21, 648, 649
proteins of, 123-25
and puromycin particles, 119
and RC-particles, 119
RNA of, 122, 123, 648, 649
RNA precursors of, 120, 121, 648, 649
and streptomycin particles, 119
in temperature-sensitive mutants, 125
in nuclei, 649
optical rotatory dispersion of
protein contribution, 443, 444
RNA contribution, 443
protein release from
cyclic AMP effect on, 151
proteins of
biosynthesis of, 123-25
and protein synthesis, 109, 114
RNA of
biosynthesis of, 122-24
5S RNA component of, 111, 112, 126, 137, 140, 141
terminal nucleotide sequences, 125, 141, 142
structure of
core particles of, 114
magnesium effect on, 113
RNA role in, 113, 114
split proteins of, 114
subunits of, 109-11, 113, 114
subunits of
particle weight of, 109
protein of, 112, 113
RNA of, 109-12, 125, 126
of temperature-sensitive mutants, 125

S

Scientific research
and progress, 1-3, 19, 20
support of, 1, 2, 17, 18
Serotonin
cyclic AMP effect, 150
lipolytic effect of, 160
and permeability
cyclic AMP effect, 164
Serum
electrophoresis of, 6, 8
Smithies, O.
and electrophoresis, 8, 9
Smooth muscle
contraction of
cyclic AMP effect, 158
cyclic AMP in, 157, 158
relaxation of, 157, 158
Snake venom phosphodiesterase
action on transfer RNA, 146
Soybean nodules
nitrogen fixation in
cell-free systems of, 333-35
and nitrous oxide, 347, 348
Spores
coats of
electron microscopy of, 55, 56, 70
isolation of, 67, 68
proteins of, 56, 68, 70
and proteins synthesis, 70
composition of
dipicolinic acid, 56, 65
and electron microscopy, 53, 54
enzymes, 58-62, 64, 65
free amino acids, 57, 58
free nucleotides, 57, 58
nucleic acids, 56, 57, 63, 64
phospholipids, 55
predicted, 53
proteins, 55, 56, 58-62
cores of
definition of, 54
isolation of, 67, 68
proteins of, 68
cortex of
isolation of, 67
mucopeptides in, 55
dipicolinic acid in, 56
disruption of, 54, 67
electron transport in, 64, 65
energy metabolism of
cytochrome role, 65
enzymes of, 64, 65
and the TCA cycle, 64
enzymes of
heat resistance of, 60, 61
quantities of, 58
variety of, 58, 59
and vegetative cell enzyme comparison, 60-62
formation of, 53
fractions of
coats, 54-56
cores, 54
cortex, 54, 55
membranes, 54, 55
germination of, 53
membranes of
electron microscopy, 55
function of, 74
and membrane-associated enzymes, 55
during sporulation, 55
metabolism of, 53
nucleic acids in, 53, 56, 57
phospholipids in, 55
preparation of, 53, 54
proteins in, 56
protein synthesis in, 62-64

RNA in
messenger RNA, 63
ribosomal RNA, 63
transfer RNA, 63
ribosomes in, 63, 64
Sporulation
and cell membranes, 55, 73
and cell permeability, 67, 68
chloramphenicol effect, 73
as differentiation, 633
and dipicolinic acid, 89
enzyme changes during, 60, 65-67
initiation of, 75
morphology of
development of, 52, 53
and DNA, 53
nucleic acids in
DNA, 56, 57, 73
RNA, 57
and proteases, 72, 73
protein breakdown during
rate of, 71, 72
and resynthesis, 71, 72
selectivity of, 72
protein synthesis during
environmental factors, 67
and heterogeneity of cell populations, 67
measurement of, 67
and protein breakdown, 71-73
rate of, 68, 69
regulation of, 74
Squalene
biosynthesis of
and cycloartenol, 685, 686
enzymes involved, 683, 684
and lanosterol, 685, 686
mechanism of, 682, 683
and 2,3-oxidosqualene, 683-86
stereochemistry of, 682, 683
cyclization of
enzyme specificity, 684
and 2,3-oxidosqualene, 683-86
Staphylococcus aureus
nuclease of
X-ray crystallography of, 36
Steroid hydroxylases
and adrenodoxin, 673-75
classification of, 672
and cytochrome P-450
catalytic functions, 673
oxygen-activation role, 672, 675
mechanism of, 674-77
NADP involvement, 672-75
Steroid isomerase
histidine in, 669
mechanism of, 668, 669
and NAD, 669-71
reactions of, 668
Steroidogenesis
ACTH action
cyclic AMP effect, 162
cyclic AMP effect, 151
Steroids
and adrenal isomerase
mechanism of, 669, 670
pathways of, 670, 671
cholesterol
conversion to steroid hormones, 677-80
and pregnenolone formation, 678, 679
and progesterone formation, 678, 679
side-chain cleavage of, 677-80
and testosterone formation, 679
degradation of
cleavage of A ring, 681
and estrone metabolism, 682
in mammalian tissues, 680
by microorganisms, 680-82
pathways of, 682
dehydrogenation, mechanism of
in B. sphaericus, 671
C-1,2-dehydrogenation, 671, 672
and flavoproteins, 671
hydroxylation, mechanism of
adrenodoxin role, 673-76
cytochrome P-450 role, 672-75
and FAD, 673, 674
and iron-oxygen complexes, 672-76
in microbial systems, 676, 677
NADP role, 672-76
postulated, 674, 675, 677
and hydroxysteroid dehydrogenases
cyclohexanones, action on, 662
and enzyme substrate interactions, 662, 667
molecular structure of substrates, 661-63
NAD role, 662
substrate specificity of, 662-66
and squalene biosynthesis
and cycloartenol, 685, 686
and lanosterol, 685, 686
mechanism of, 682-86
and 2,3-oxidosqualene, 683-86
stereochemistry of, 682, 683
and steroid isomerase
and adrenal isomerase, 669-71
mechanism of, 668, 669
NAD role, 669-71
reactions of, 668
Submicroscopic particles
fractionation of, 15
Subtilisin
conformational changes in, 382
action on pancreatic ribonuclease, 30
Succinic anhydride
acylation of proteins with, 699
Succinic dehydrogenase
lipid requirement of, 470, 471
Sulfenyl halides
reactions of
with proteins, 707, 708
Sulfhydryl groups
reactions of
with acrylonitrile, 709
with N-alkylmaleimides, 708, 709
Suppressors
amber suppressor transfer RNA
primary structure, 132-37, 145
Svedberg, T.
and the ultracentrifuge, 3-5
Svensson, H.
and refractive index methods, 6, 9

T

Taylor, H. S.
and adsorption phenomena, 5
Testosterone
biosynthesis of, 679
Tetranitromethane
reaction of
with proteins, 708, 709
Theophylline
diuretic effect of
and cyclic AMP, 164
hyperglycemic response to, 161
inotropic effect of, 157
insulin-releasing effect, 165, 166
lipolytic effect of, 158
and salivary glands
effect in, 165

and thyroid gland
effect on, 168
toad bladder
effect in, 164
Thermal denaturation
of transfer RNA, 144
Threonine
biosynthesis of
enzymes of, 84-88
genetics of, in yeast, 88
pathway of, 84
Threonine deaminase
inhibition of, 93, 94
kinetics of, 93, 94
Thymidine kinase
of animal tumors
allosteric effects in, 213
aggregated form of, 213
kinetics of, 213
and DNA synthesis, 213, 214
of E. coli
activation of, 212
allosteric effects in, 212, 213
inhibition of, 213
kinetics of, 212, 213
in plant cells, 214
of Tetrahymena pyriformis, 213
Thymidylate kinase, 219, 220
Thymidylate synthetase
control of, 219
as rate-limiting step in dTTP synthesis, 220
Thymine
dimer formation, 177
hydroperoxide formation, 177
Thyrotropin
cyclic AMP effect, 150
lipolytic effect of, 158
thyroid gland, effect on cyclic AMP effect, 168
Tiselius, A.
and electrophoresis
early work, 4, 5
of serum, 6, 8
and the Nobel prize, 11-13
and refractive index measurement, 4
and the ultracentrifuge, 3, 4
Tobacco mosaic virus (TMV)
as an antigen, 508
passage of
through membranes, 484
protein of
crystalline form, 36
point mutations in, 772, 773
RNA of
optical rotatory dispersion, 437, 438, 440, 445
terminal nucleotides of, 141, 143
Tobacco necrosis virus
satellite virus of
RNA termini, 141, 143
Transfer RNA
and activating enzymes, 145
in bacterial spores, 57, 63
biosynthesis of
in embryos, 643
and O-acyl esters of amino acids, 311
primary structure of
anticodons in, 133-35, 144
common nucleotide sequence in, 133, 134, 144, 145
comparisons of, 131-37
complete sequences of, 131-36
terminal nucleotide sequences of, 137, 138
secondary structure of
anticondon position in, 135, 144, 145
base pairs in, 133-35, 145
cloverleaf arrangement of, 133-35, 144-46
G:U base pairs, 145
loops in, 133-35, 145
terminal nucleotides of
turnover of, 643
tertiary structure of, 144
Triglycerides
biosynthesis of
and acyl carrier protein, 304, 305
and Coenzyme A, 304, 305
and glycerophosphate, 304
in microsomes, 304
Triiodothyronine
cyclic AMP effect, 150
Trinitrobenzenesulfonic acid
reaction of
with proteins, 705
TPNH
formation of, 263
see also NADP
Tropomyosin
and $\alpha$-actinin, 527, 528
aggregation of, 526
dimensions of, 526
$\alpha$-helix in, 526
and F-actin, 526
molecular weight of, 526
subunits of, 526
sulfhydryl groups of, 526
in thin filaments, 527
and troponin, 526, 527
Tryptophan
biosynthesis of
anthranilate synthetase role, 99-101
chorismate inhibition of, 97-99
chorismate mutase role, 98, 99
chorismate synthetase role, 98
control of, 97-105, 423, 424
DAHP synthetase role, 97-100
enzyme aggregates in, 98-103
feedback inhibition in, 97-100
genetics of, 97, 101, 102, 105
and indoleglycerol phosphate synthetase, 101-3
permease role in, 105
phenylalanine effect on, 97-99
phosphoribosyl anthranilate isomerase role in, 102, 103
phosphoribosyltransferase role in, 101
prephenate inhibition of, 97, 98
shikimate kinase role in, 99
tryptophan effect on, 97, 99-101
tryptophan synthetase role in, 103-5
tyrosine effect on, 97-99
oxidation of
in proteins, 715, 716
reaction of
with benzyl halides, 707
Tryptophan synthetase
of E. coli
A protein of, 103
B protein of, 103, 104
reactions of, 393
structure of, 103-5, 393, 772, 773
of N. crassa, 105
Tuberculostearic acid
biosynthesis of, 688
Tyrosine
acylation of
in proteins, 698-700
biosynthesis of
anthranilate synthetase role, 99, 100
chorismate inhibition of, 97-99
chorismate mutase role, 98, 99
chorismate synthetase

role, 98
control of, 97-105
DAHP synthetase role, 97-100
enzyme aggregates in, 98-103
feedback inhibition in, 97-100
genetics of, 97, 105
permease role in, 105
phenylalanine effect on, 97-99
prephenate dehydratase role in, 99, 100
prephenate inhibition of, 97, 98
shikimate kinase role in, 99
tryptophan effect on, 97, 99, 100
tyrosine effect on, 97-100
and cyanuric fluoride reaction, 705, 706
and diazonium salts, coupling with, 710
iodination of
in proteins, 711
nitration of
in proteins, 709, 710
oxidation of, 716, 717
Tyrosine aminotransferase
cyclic AMP effect on, 151, 154, 155

U

Ultraviolet irradiation
of DNA
and dimer formation, 177
and DNA degradation, 182
and hydrate formation, 178
and protein cross-links, 178
and reactivation of, 192
and repair of, 179-81
and lysogeny
in recombination deficient mutants, 187
sensitive mutants of E. coli, 179-82, 184, 185

V

Valine
biosynthesis of
genetic aspects, 95, 96
and isoleucine biosynthesis, 94-96
Vasopressin
antidiuretic effect of
and cyclic AMP, 163, 164
cyclic AMP effect, 150
prostoglandin anatogonism of, 164
see also Hormones
Viruses
viral DNA
alkylation of, 179
viral RNA
terminal nucleotides of, 141-43
see also specific viruses

W

Watson-Crick structure
in DNA
role in recombination, 190, 191
in RNA, 133-35
Weibull, C.
and bacterial flagellae, 13, 13
Wheat germ
RNA of
terminal nucleotide sequence, 139, 142
"Wobble" hypothesis
and transfer RNA, 144

X

X-ray crystallography
of carbonic anhydrase
structure of, 34
and sulfonamide inhibition, 34
of carboxypeptidase
active site in, 367, 368
and conformational changes accompanying catalysis, 33, 34
structure of, 33, 34, 367, 368
and zinc, 368
of chymotrypsin
active site of, 367
and conformational changes, 367
and crystal form, 28
molecular conformation of, 28-30
structure of, 367
of chymotrypsinogen
conversion to chymotrypsin, 26, 27, 30
similarity to $\pi$-, $\delta$-, and $\gamma$-chymotrypsins, 30
of cytochrome c, 35, 774, 775
and enzyme activity in crystalline state, 44-46
of hemoglobin, 41, 42, 746, 747
of lysozyme
cleft in, 363-65
and $\alpha$-helix structure, 363
structure of, 363-65
and $\beta$ structure, 363
and substrate binding, 363-65
of myoglobin
conformation of, 37, 746, 747
heme-linkage in, 37
of papain, 35
and protein-modification studies
active site identification, 368
and binding, 368, 369
of proteins
conformational motility in, 39
effect of crystal form, 40
general conclusions from, 37-44
$\alpha$-helix in, 39
ligands, effect of, 40, 41
pleated-sheet structure in, 39
in relation to other techniques, 46
relevance to biological environment, 44-46
and stereochemistry of the main chain, 37
of ribonuclease, 30-33, 365, 366
of TMV protein, 36
X-ray scattering
of transfer RNA, 144

Y

Yeast
chorismate mutase of, 99, 100
cytochrome c of, 734, 737, 742, 743
deoxyarabinoheptulosonate synthetase of, 98
fatty acid synthetase of
and acylation, 305, 306
and coenzyme A, 305, 306
glyceraldehyde-3-phosphate dehydrogenase of
and allosteric effects, 394, 395
and DPN binding, 394, 395
glycolysis in
control of, 282, 283
lecithin biosynthesis in, 308
methionine synthesis in, 89
purine biosynthesis in, 205
steroid biosynthesis

in, 687
threonine deaminase of, 94
threonine synthesis in, genetics of, 88
transfer RNA of 99-103
structure, 131-39, 144-46
terminal nucleotide sequences, 138
tryptophan synthesis in,
Z
Zeolite crystals, 5, 6

ANNUAL REVIEW OF BIOCHEMISTRY

EDITORIAL COMMITTEE (1968)

P. D. BOYER
D. S. HOGNESS
M. D. KAMEN
E. P. KENNEDY
J. M. LUCK
E. RACKER
H. K. SCHACHMAN
H. A. SOBER

Responsible for the organization of Volume 37
(Editorial Committee, 1966)

C. B. ANFINSEN
P. D. BOYER
D. S. HOGNESS
M. D. KAMEN
J. M. LUCK
E. RACKER
H. K. SCHACHMAN
E. R. STADTMAN

# ANNUAL REVIEW OF BIOCHEMISTRY

PAUL D. BOYER, *Editor*
*University of California, Los Angeles*

ALTON MEISTER, *Associate Editor*
*Cornell University Medical College*

R. L. SINSHEIMER, *Associate Editor*
*California Institute of Technology*

ESMOND E. SNELL, *Associate Editor*
*University of California, Berkeley*

VOLUME 37

1968

ANNUAL REVIEWS, INC.
4139 EL CAMINO WAY
PALO ALTO, CALIFORNIA, U.S.A.

[redacted] Library
610.5
A615
R45
v.37

ANNUAL REVIEWS, INC.
PALO ALTO, CALIFORNIA, U.S.A.

© 1968 by Annual Reviews, Inc.
All Rights Reserved

*Library of Congress Catalogue Card Number: 32-25093*

FOREIGN AGENCY
Maruzen Company, Limited
6, Tori-Nichome Nihonbashi
Tokyo

PRINTED AND BOUND IN THE UNITED STATES OF AMERICA
BY GEORGE BANTA COMPANY, INC.

# PREFACE

To serve the profession adequately, the Annual Review of Biochemistry must reflect the changing interests of research in biochemistry, molecular biology, and biophysics. This makes demands on the Review not only for expansion but for specialization. In addition to topics that cover broad segments of fields, the Editorial Committee has attempted to choose special chapters that review particular areas in depth. Examples of such topics in the present Review are the chapters on "Cyclic AMP," "DNA Repair," "Energy Transfer in Polynucleotides," and "Bioluminescence." Reviewers are asked to provide perspective and to present the most relevant research work, rather than to attempt to give complete annotated bibliographies. This not only increases the willingness of the reviewer to undertake his job, but usually results in a more scholarly and penetrating review, and one that can serve to stimulate further research as well as to document past accomplishments.

Two years ago the Preface called attention to a change in the Annual Review akin to the primary biological phenomenon of binary fission, namely appearance of the Review in two parts. This reflected the growth of biochemistry and allied disciplines. This year, however, the Review can be presented in one part. An analogy of a biological process again may be appropriate; the Review has shown an oscillatory response. In an attempt to be assured of adequate control on expansion, increased restrictions on the number of topics and pages were imposed. These controls were in retrospect too severe, but the single volume produced is of high quality. The controls have been relaxed somewhat in planning for subsequent volumes. Hopefully, refinement in the controls will dampen future oscillations and give consistent presentation of each year's Review in two parts.

The Preface gives us an opportunity to record our sincere appreciation for services of Dr. Earl Stadtman, who recently retired from the Editorial Committee after serving a five-year term, and to welcome as his replacement Dr. Eugene Kennedy. For the preparation of the present Volume, it is a pleasure to acknowledge the capable service of Lynda Snavely, our Assistant Editor. Her pleasant and remarkable efficiency is an unusual asset for the Review. For preparation of the Subject Index, we are indebted to Mrs. Beryl Glitz, and her consultant-husband, Dr. John Glitz.

Each Review reminds us of both the rapid advance of time and the marked progress in our science. Indeed, for biochemistry time and progress have become firmly and positively linked. This is a happy state of affairs, and one we trust will long continue.

The Editorial Committee

# CONTENTS


REFLECTIONS FROM BOTH SIDES OF THE COUNTER, *Arne Tiselius* . . 1

IMPLICATIONS OF X-RAY CRYSTALLOGRAPHIC STUDIES OF PROTEIN STRUCTURE, *Lubert Stryer* . . . . . 25

ORIGIN OF PROTEINS IN SPORULATION, *Arthur Kornberg, James A. Spudich, David L. Nelson, and Murray P. Deutscher* . . . . .51

SOME ASPECTS OF AMINO ACID BIOSYNTHESIS IN MICROORGANISMS, *P. Truffa-Bachi and G. N. Cohen*. . . . . 79

RIBOSOME FORMATION AND STRUCTURE, *Syozo Osawa* . . . . . 109

PRIMARY STRUCTURE OF RNA, *J. T. Madison* . . . . . 131

CYCLIC AMP, *G. A. Robison, R. W. Butcher, and E. W. Sutherland* . . 149

DNA REPAIR, *Paul Howard-Flanders*. . . . . 175

THE CONTROL OF NUCLEOTIDE BIOSYNTHESIS, *Raymond L. Blakley and E. Vitols*. . . . . 201

ENZYMATIC REACTIONS INVOLVING CORRINOIDS, *H. P. C. Hogenkamp* . 225

THE REGULATION OF GLYCOLYSIS AND GLUCONEOGENESIS IN ANIMAL TISSUES, *Michael C. Scrutton and Merton F. Utter* . . . . . 249

LIPID CHEMISTRY AND METABOLISM, *Howard Goldfine* . . . . . 303

BIOLOGICAL NITROGEN FIXATION, *R. W. F. Hardy and R. C. Burns.* . 331

THE CATALYTIC AND REGULATORY PROPERTIES OF ENZYMES, *D. E. Koshland, Jr. and K. E. Neet* . . . . . 359

REGULATION OF GENE EXPRESSION, *Wolfgang Epstein and Jonathan R. Beckwith* . . . . . 411

ROTATORY DISPERSION AND CIRCULAR DICHROISM, *Sherman Beychok* . 437

MEMBRANE BIOCHEMISTRY, *L. Rothfield and A. Finkelstein*. . . . 463

IMMUNOCHEMISTRY, *Edgar Haber* . . . . . 497

BIOCHEMISTRY OF MOTILITY, *I. R. Gibbons* . . . . . 521

CROSS-LINKING OF COLLAGEN AND ELASTIN, *Karl A. Piez* . . . . 547

ENERGY TRANSFER IN POLYNUCLEOTIDES, *M. Guéron and R. G. Shulman* . . . . . 571

BIOLUMINESCENCE, *J. W. Hastings* . . . . . 597

BIOCHEMISTRY OF DIFFERENTIATION, *P. R. Gross* . . . . . 631

BIOCHEMISTRY OF STEROIDS, *Charles J. Sih and H. W. Whitlock, Jr.* . 661

GROUP-SPECIFIC REAGENTS IN PROTEIN CHEMISTRY, *Louis A. Cohen* . 695

COMPARATIVE ASPECTS OF PRIMARY STRUCTURES OF PROTEINS, *C. Nolan and E. Margoliash* . . . . . 727

INDEXES . . . . . 791

AUTHOR INDEX . . . . . 791

SUBJECT INDEX . . . . . 825

CUMULATIVE INDEX OF CHAPTER TITLES, VOLUMES 33 TO 37 . . . 856

CUMULATIVE INDEX OF CONTRIBUTING AUTHORS, VOLUMES 33 TO 37. . . . . 858

Annual Reviews, Inc., and the Editors of its publications assume no responsibility for the statements expressed by the contributors to this *Review*.

## A WORD ABOUT REPRINTS

The reader may be puzzled by the conspicuous number (659 to 684) aligned in the margin with the title of each review in this volume. The number is a key for use in the ordering of reprints. The reprint numbers pertinent to earlier reviews are given in a free Reprint Brochure which is available on request. All of the 185 available are listed chronologically, both by author and by subject, in the descriptive brochure.

Reprints of all articles published in the *Annual Reviews of Biochemistry and Psychology* from 1961 to 1968 inclusive are maintained in inventory. In addition, a limited number of reprints beginning with the 1968 editions of the *Annual Reviews of Microbiology and Physiology* will be made available on a "while quantities last" basis.

Available reprints are priced at the uniform rate of $.95 each, postpaid. Payment must accompany the order if the purchase totals less than $10.00. All payments are to be made payable to Annual Reviews, Inc. in U.S. dollars. California orders are subject to 5 per cent sales tax. Delivery in the U.S.A. will require approximately two to six weeks.

The sale of reprints of articles published in the *Reviews* has been initiated in the belief that reprints as individual copies, as sets covering stated topics, and in quantity for classroom use will have a special appeal to students and teachers.